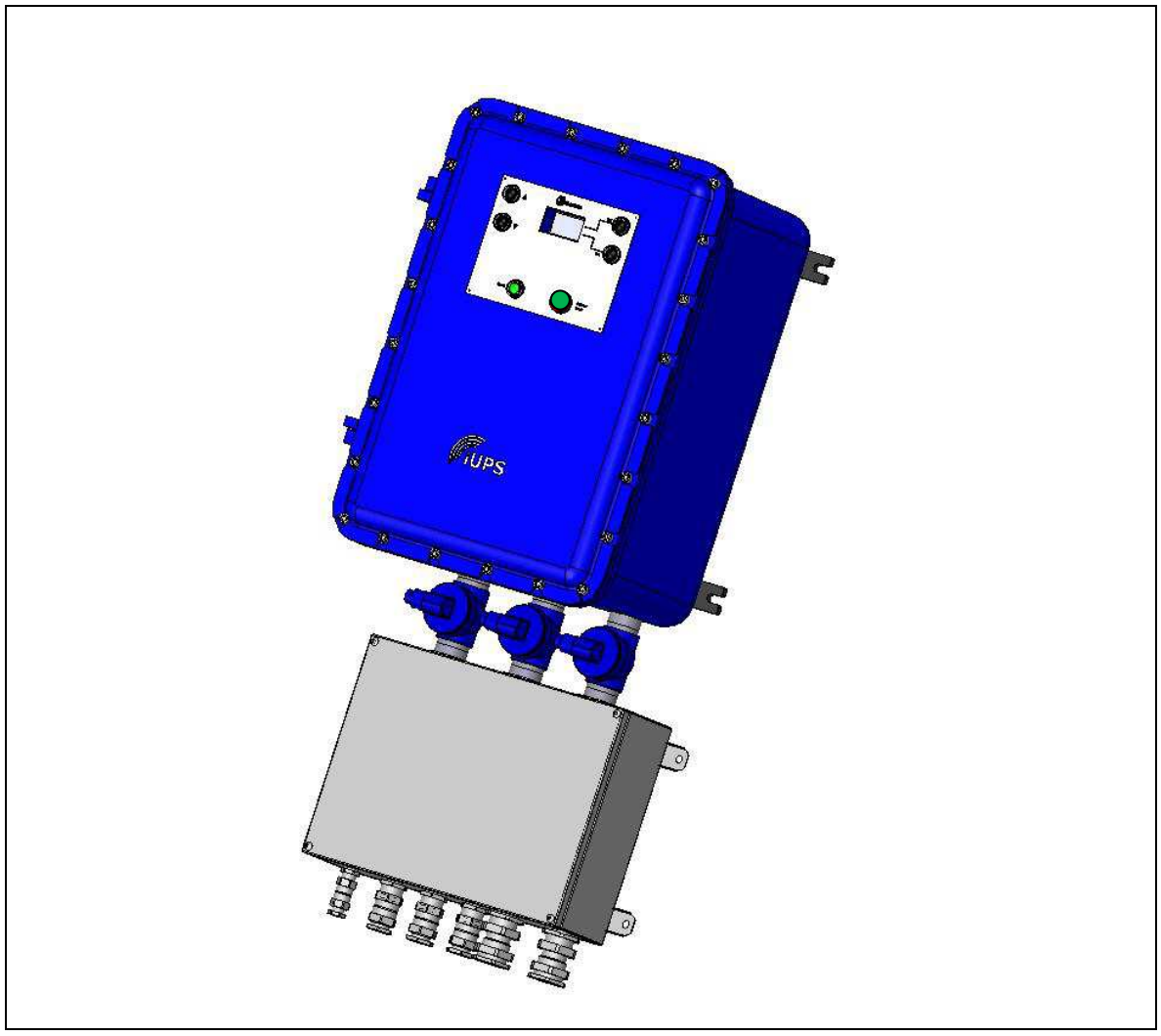

Installation & Operating Manual

iUPS101

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1 Introduction

The iUPS101 Uninterruptible Power Supply system is certified for use in Zone 1 hazardous areas and provides back up of 120VAC or 230VAC up to 3KVA load as a stand alone system, or up to 9kVA load as part of a modular parallel system. Critical equipment, such as SIL rated control systems, navigation or landing lighting, or blow out prevention systems, are protected in the event of a blackout or brownout.

System run times are outlined in this manual, and are achievable when using the iUPS101 in conjunction with the iBATT100 Zone 1 ATEX / IECEx certified 24V Battery Enclosure. System run times can also be increased by specifying a 48V system which uses two iBATT100 enclosures to more than double the backup time of a standard 24V system.

Designed to be wall mounted the iUPS101 UPS system comprises an aluminium alloy Ex'd' charger/inverter enclosure close coupled to a stainless steel Ex'e' terminal enclosure. This allows easy access to incoming/ outgoing cables thus alleviating the need to open the Ex'd' enclosure

The Ex'd' enclosure has a glass window housing the UPS display which shows live system information and allows configurable parameters to be set by the user. Various alarm and status information can be configured using the Ex'd' buttons on the front panel on the UPS. Also included are two user programmable volt free contacts, which allow the user to utilize various UPS alarms and status information.

The system includes advanced battery charge controls including built in temperature compensation to ensure the correct charging of the lead acid battery.

2 Safety Information and Notes

2.1 Storage of this Manual

Keep this user manual safe and in the vicinity of the device. All persons who have to work on or with the device should be advised on where the manual is stored.

2.2 Special Conditions for Safe Use

None

2.3 List of Notes

The notes supplied in this chapter provide information on the following.

- Danger / Warning.
  - Possible hazard to life or health.
- Caution
  - Possible damage to property.
- Important
  - Possible damage to enclosure, device or associated equipment.
- Information
  - Notes on the optimum use of the device

Warning	**Installation to be by skilled electricians and instructed personnel in accordance with national legislation, including the relevant standards and, where applicable, in accordance with IEC 79.17 on electrical apparatus for explosive atmospheres.**

Warning!	**The iUPS101 may only be operated in Zone 1 and Zone 2 hazardous areas. Refer to the ATEX certificate for further information.**

Warning!	**All parts of the enclosure must never be opened while energised, or when an explosive gas atmosphere is present.**

Warning!	**The iUPS101 has two different supplies. Both the AC mains input and DC battery input must be isolated before accessing the enclosure**

Important	**The technical data indicated on the iUPS101 ATEX rating plate, in this manual and the ATEX certificate must be observed at all times.**

Important	**The ATEX rating plate must be fitted at all times, if damaged it must be replaced immediately or the iUPS101 must be removed from service and the hazardous area.**

Important	**Changes in the design and modifications to the equipment are not permitted.**

Important	**The iUPS101 shall be operated as intended and only in an undamaged condition.**

Important	**Only suitably rated loads may be connected to the iUPS101.**

Important	**For systems with periods of inactivity, such as a long shutdown or moving/storing a mobile system where the UPS is not in use and there is no AC mains supply. Users should remove DC supplies to the system when not in use.**

Caution	**The iUPS101 may weigh up to 90Kg, therefore ensure that the assembly is mounted using suitable fixtures.**

Caution	**Never operate the iUPS101 unit outside of its rated voltage, current & power as indicated in the specification or the safety of the unit may be impaired.**

Caution	**Never exceed the maximum output loading of the iUPS101 as stated in the specifications. Adequate protection such as a fuse / breaker must be fitted to connecting equipment to prevent exceeding maximum load.**

Important	**For the installation, maintenance and cleaning of the units, it is absolutely necessary to observe the applicable regulations and provisions concerned with explosion protection (EN60079-0:2009, EN 60079-14:2008) as well as the Accident Prevention Regulations.**

Important	**The iUPS101 must not be stored or operated outside of its rated temperature range as stated on the ATEX certificate.**

Important	**Any unused cable entries must be fitted with a suitably certified blanking plug to maintain the IP of the equipment**

Important	**Under no circumstances must the close coupled Ex ‘e’ Terminal enclosure be used to lift the iUPS101. This will cause stress on the cable glands and invalidate the ATEX certification. The iUPS101 must only be handled by way of the Ex ‘d’ enclosure**

3 Installation and Set-to-work

3.1 Installation

The iUPS101 is supplied ‘close-coupled’ to an Ex ‘e’ terminal box using potted cable transits. All equipment is suitably certified, and assembled under the relevant codes of practice (see section 7). This allows simple connection to suitably rated Ex ‘e’ cable terminals by the user.

For reference, the drilled cable entries on the bottom face of the Ex ‘d’ enclosure can be up to 1-1/2”NPT type or up to M40. The information on the exact type of entry can be found on the enclosure rating plate. The Ex ‘d’ box should never be opened apart from scheduled maintenance / inspection by a qualified person. Please see Safety / Information notes in section 2.

The iUPS101 is only permitted to be mounted in a vertical orientation.
The system weighs approximately 90Kg, so suitable lifting equipment and safety provisions must be taken to ensure safe installation.

Correct Vertical Installation:

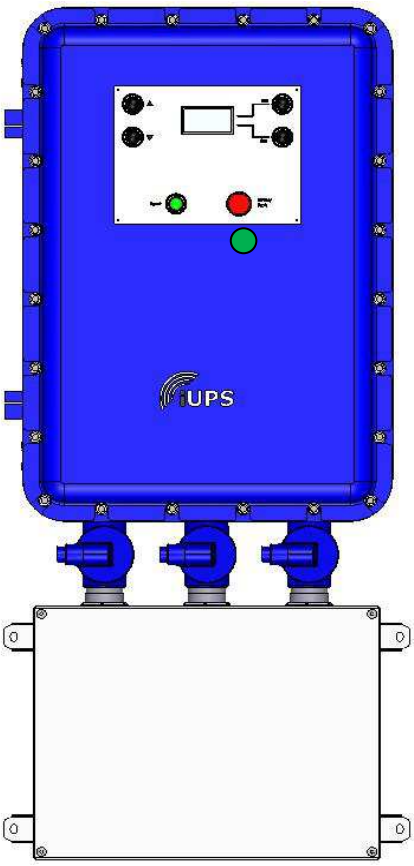


Fig 3.

Important!	**The information shown on the ATEX rating plate is in relation to the safety of the equipment. The functional operating parameters of the system may vary slightly. Please see section 7 for details**

3.2 Fitting the Cables

Warning!	**Installation to be by skilled electricians and instructed personnel in accordance with national legislation, including the relevant standards and, where applicable, in accordance with IEC 79.17 on electrical apparatus for explosive atmospheres.**

3.2.1 Grid-connected emergency systems

The UPS can be used as an emergency system, also known as an uninterruptible power supply (UPS) – enabling a reliable supply to a site connected to an unreliable network. In the event of an interruption to the energy supply from the public grid, the UPS, connected to a battery, substitutes the faulty source and enables a support supply to the users connected downstream.
These will be supplied as long as the energy stored in the battery allows. The battery will quickly be recharged at the next reconnection to the public grid.
The AC input to the iUPS101 unit must be powered via an external site circuit breaker/switch to allow disconnection of the power. This should be located close to the unit and be suitably marked to identify it as the isolating device for the iUPS101 unit.

The use of the UPS must be carried out by qualified personnel who have been checked by the responsible local authorities. The applicable local standards and regulations must be adhered to.

3.2.2 Distributed Minigrid

The implementation of the UPS on top of a distributed minigrid requires special care in choosing the distribution system. A TT distribution is recommended for the DC grid as well as for the AC grid.

Warning!	**The IT system (Power distribution system which is isolated from earth) is not recommended for the distribution. This distribution is generally forbidden by local laws**

3.2.3 Earthing system

The UPS is a protection class I unit, which is intended for cabling in a grid type TT, TN-S or TNCS. The earthing of the neutral conductor *(E) is carried out at a sole installation point, upstream of the RCD circuit breaker *(D).

*(E) Earth-neutral connection bridge:
The neutral is earthed at a single point of the installation, downstream of the source and upstream of the protection device(s) at the default current (DDR). When several sources are available, each source must have an earthed neutral. If the source has to be retained with an isolated earthling system (IT) the applicable local provisions and regulations must be applied.

*(D) Differential circuit breaker:
A protection device must be installed downstream of the source according to the local requirements and in compliance with the applicable regulations and standards.

The UPS can be operated with any earthing system. In all cases it is imperative that the protective earth be connected in compliance with the applicable standards and regulations. The installer is responsible for the conformity of the installation with the applicable local standards.

3.2.4 Mobile installation or installation connected to the grid via plug connector

When the input of the device is connected directly to the grid via a plug, the length of the cable must not exceed 2 m and the plug must remain accessible.
In the absence of voltage at the input, the neutral and live are interrupted, thereby guaranteeing complete isolation and protection of the cabling upstream of the UPS.
The earthing system downstream of the UPS is determined by the upstream earthing system when the grid is present. In the absence of the grid, the earthing system downstream of the inverter is in isolated mode. The safety of the installation is guaranteed by the equipotential bonding.

Warning!	**The connection (link) between the neutrals *(C) upstream and downstream of the UPS is not permitted in this configuration.**

*(C) Connection of the neutrals:
In a fixed installation where the neutral is connected to the earth at a single installation point upstream of the UPS, it is permissible to carry out a connection of the neutrals in order to preserve an unchanged earthing system downstream, independent of the operating mode of the UPS. This choice shows the advantage of keeping the differential protection devices downstream of the UPS.
This connection (C) is not permitted if a socket is installed upstream of the UPS.

This connection type guarantees the optimal continuity for supplying the UPS loads. The first isolation fault will not lead to an interruption in the supply. If the installation requires the use of a permanent isolation controller this would have to be deactivated when the TT network is present at the UPS input.

Warning!	**All sockets and protection class I devices connected downstream of the UPS must be properly connected to the earth (earthed socket). The cabling rules above remain valid, including fixed installations, in all cases where the UPS input is connected to the grid via a plug connector.**

3.2.5 Fixed Installation

The installation may be equivalent to a mobile installation (with interrupted neutral). In a fixed installation where the neutral is connected to the earth at a single installation point upstream of the UPS, it is permissible to carry out a connection of the neutrals in order to preserve an unchanged earthing system downstream, independent of the operating mode of the UPS. This choice has the advantage of keeping the protection devices downstream of the UPS. This connection can be carried out by modifying the configuration using the control panel.
In this case the appearance of the first fault will lead to the installation stopping or the disconnection of the protection devices upstream and/or downstream of the UPS. Safety is guaranteed by the equipotential bonding and by any RCD circuit-breakers placed downstream.
This connection (C) is not permitted if a socket is installed upstream of the UPS.

3.2.6 Installation with automatic PE-neutral switching

In certain applications, it is desirable to keep the neutral upstream and downstream of the UPS separated (C) while re-establishing the earthing system (TN-S, TT or TNC-S) in the absence of voltage at the input. This can be programmed by the configuration via the control panel. This modification must be carried out possessing technical knowledge, at the responsibility of the installer and in conformity with the applicable regulations and standards.

3.2.7 Connecting the cables

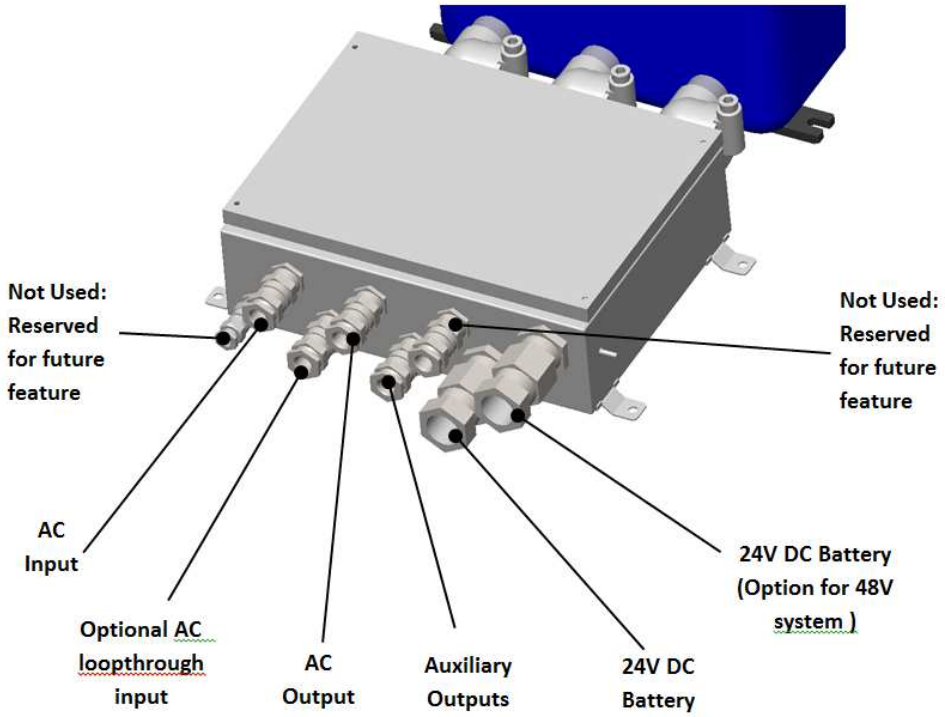
IMPORTANT!	**All cables should be connected to the iUPS101 via the correct cable gland and fitted by a competent person.**

IMPORTANT!	**Changes in the design and modifications to the equipment are not permitted. If any changes are performed on the enclosure the ATEX certification will become void.**

Important	**The installer MUST ensure that all cables have adequate mechanical protection to avoid damage to the wires.**

IMPORTANT!	**Users must read the Installation and maintenance instructions supplied for the iSTB Enclosure assembly before terminating any cables. (Included in Chapter 10 for reference)**

Remove the cover from the Ex ‘e’ Terminal box and fit the cables in the correct positions shown below for your product:



3.2.8 24V Cable Termination:

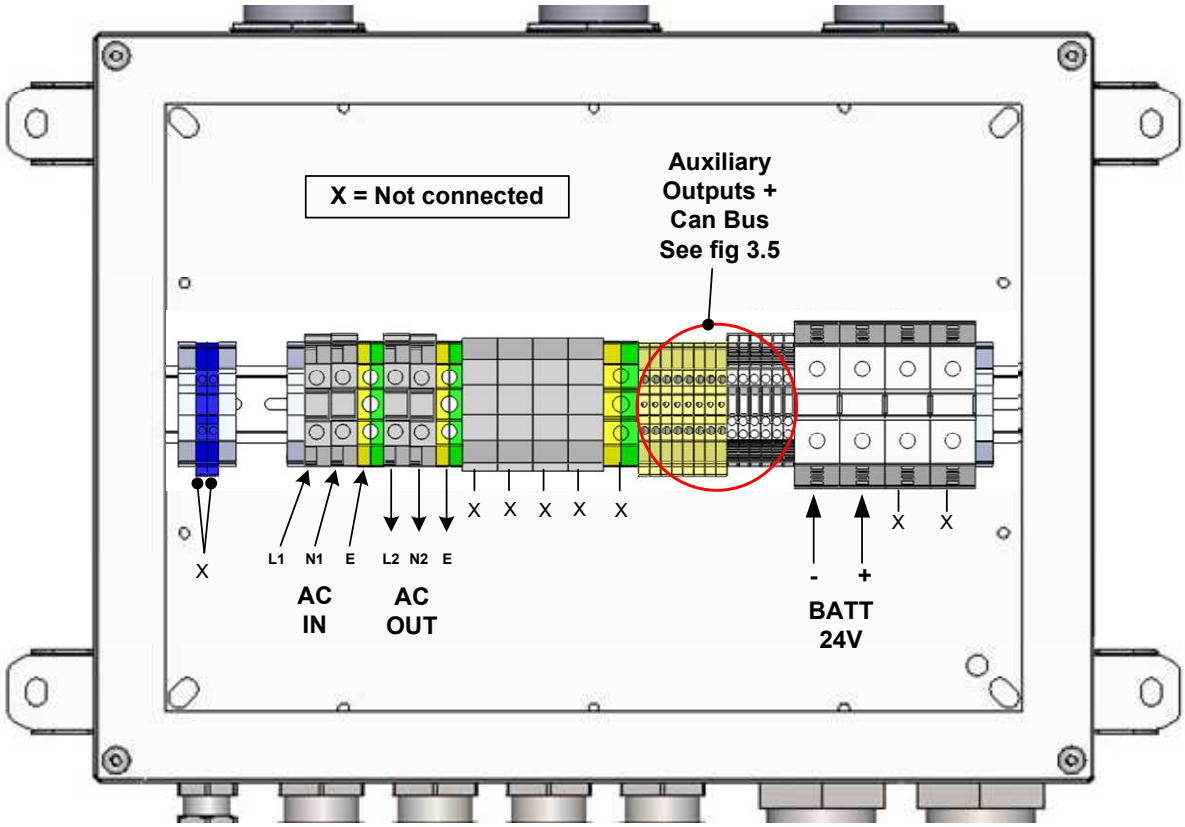


Fig 3.2

3.2.9 48V Cable Termination:

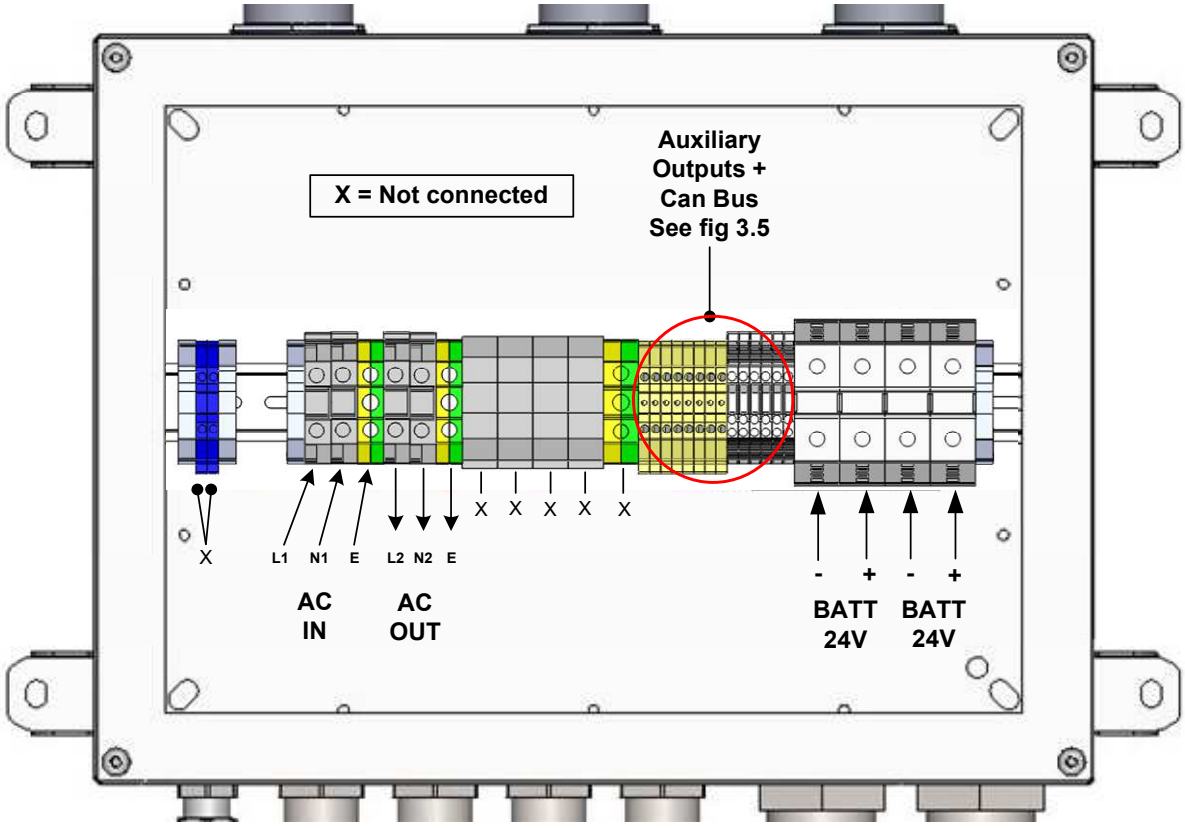


Fig 3.3

3.2.10 Parallel AC Output Termination:

It is possible to parallel the AC outputs of up to 3 x iUPS101 systems together. A maximum of 2 systems can be connected in the Ex 'e' terminal box to provide twice the power – **Contact Extronics before connecting systems in this manor.** See Fig 3.4

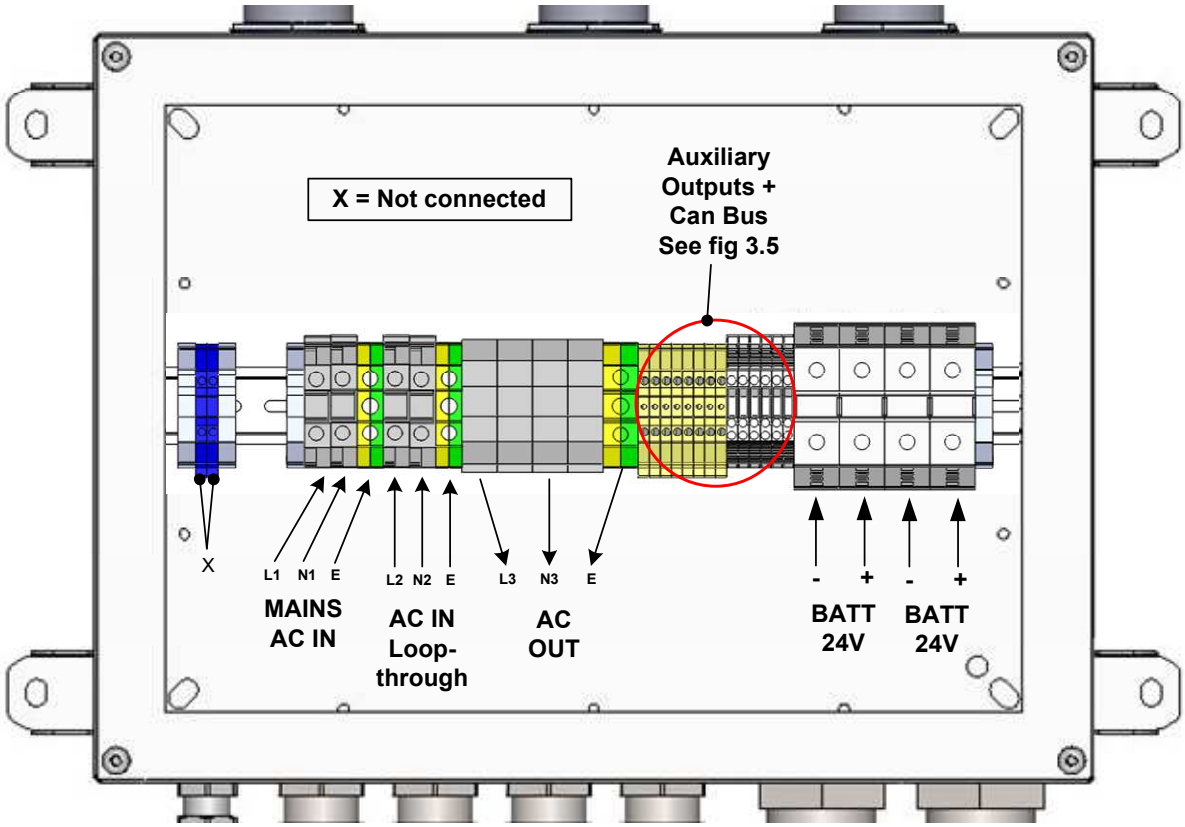


Fig 3.4

3.2.11 Auxiliary Output & CANBUS:

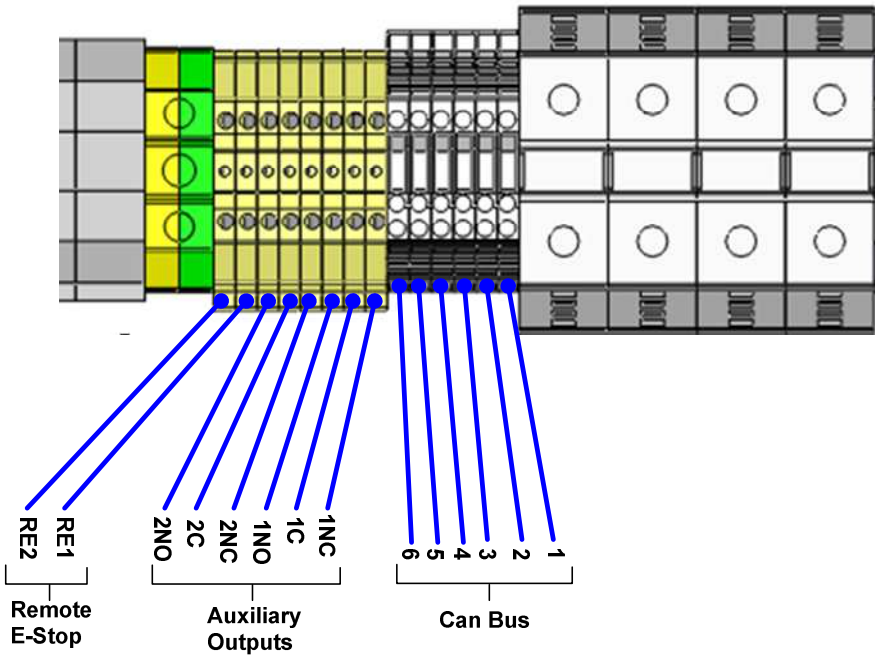


Fig 3.5

3.2.12 Emergency Shutdown Signal

This signal is disabled by default. You must enter the Ex'd' enclosure to enable this functionality. More detail on the configuration and behaviour of this signal can be found in section 4 of this manual.

Emergency shutdown signal is a 'hot' 24-48Vdc signal provided by the user. Please see fig 3.5 for details. The signal is not polarity dependant, and therefore can be the wires can be inserted in either of the terminals shown in fig 3.5.

3.2.13 CAN bus connections

These are not required on standalone iUPS101 units. These connections are used when multiple iUPS101 units are connected in a parallel configuration (as per 3.2.10) with a common battery bank. This is a communication connection between the UPS's and is used to allow synchronisation of the AC outputs for parallel UPS's. Failure to provide this connection could lead to the system failing to power on or stoppage of the UPS.

If you are connecting units in parallel, please ensure you have consulted Extronics to advise that systems are to be connected in this manor, as correct termination of CANBUS cabling is required internally to the Ex'd' enclosures. Providing you are happy your UPS has been configured for parallel operation, you can connect the CAN wires between the UPS's as shown in section 3.2.11

Please note connecting cable should be a 3x twisted pair connected in a 1:1 manor between each UPS.

3.2.14 Connecting the AC supply sources

The UPS is intended to be supplied by alternative voltage sources such as the public grid or a generator. Check that the rated voltage of the source corresponds to the rated voltage of the UPS specified on the rating plate.

The source must be connected to the correct 'Mains AC IN' shown in the product diagrams above with sufficient wire section at least equal to the max AC input current shown in the table 3.0 below.

The AC input current ratings are higher than the output ratings as the system may be supplying the load and recharging the batteries at the same time following a discharge.

Important!	**There is no circuit protection on the AC input to the UPS. Users should provide adequate protection against overload by way of a suitable circuit protection device such as a RCB / MCB or fuse that is correctly rated for the system– see the table below.**

iUPS101 Max Rated Power (VA)	230V System Max AC input current (A)	120V System Max AC input current (A)
Up to 3000	27	50
Up to 2500	24	44
Up to 2000	21	39
Up to 1000	16	28

Table 3.0

3.2.15 Connecting the AC output

High voltages may be present on the connection terminals. Make sure that the inverter is deactivated and that there is no AC or DC voltage present on the AC IN terminals and battery terminals, before proceeding with the connection.
The AC output connections must be wired with sufficient wire section at least equal to the max AC output current of the Product shown in table 3.1 below:

iUPS101 Max Rated Power (VA)	230V System Max AC output current (A)	120V System Max AC output current (A)
Up to 3000	15	30
Up to 2500	12	25
Up to 2000	10	20
Up to 1000	5	10

Table 3.1

3.2.16 Connecting the battery

IMPORTANT!	**Before connecting the battery, carefully check the voltage and polarity of the battery using a voltmeter. Incorrect polarity or surge voltage may seriously damage the device.**

IMPORTANT!	**For systems with periods of inactivity, such as a long shutdown or moving/storing a mobile system where the UPS is not in use and there is no AC mains supply. Users should remove DC supplies to the system when not in use.**

The iUPS101 is designed to be used in association with the iBATT100 Zone 1 battery enclosure. Terminate the battery cables to the appropriate connections shown in the diagrams above.

3.2.17 Wiring auxiliary contacts

These contacts are reversing contacts that are potential-free. The admissible currents and voltages for these contacts are 12A: 250 VAC/24VDC or 3A: 50 VDC max. The cabling of these auxiliary contacts depends solely on the application and cannot be described in this manual. These auxiliary outputs are not intrinsically safe, and if used, the cabling / connected equipment must be taken to a safe area.
For more information on configuring the auxiliary contacts, please see chapter 8 of this manual.

3.3 Setting to work

Once all cables are connected correctly and inspected, refit the enclosure lid using the four screws previously removed. Connect the battery cables within the battery enclosure – consult iBATT100 operating manual.

Note!	**Ensure the lid is secure, correct cable glands are fitted and the unit device correctly wired and earthed for the particular application before applying power**

Note!	**Ensure that the lid gasket is clean and undamaged before fitting the lid.**

3.4 Fusing

All fuses for the system are supplied fitted and contained within the Ex ‘d’ enclosure and protect against system faults or overload. Should the fuses blow or need to be inspected, only a qualified person must open the Ex ‘d’ enclosure – see section 2.

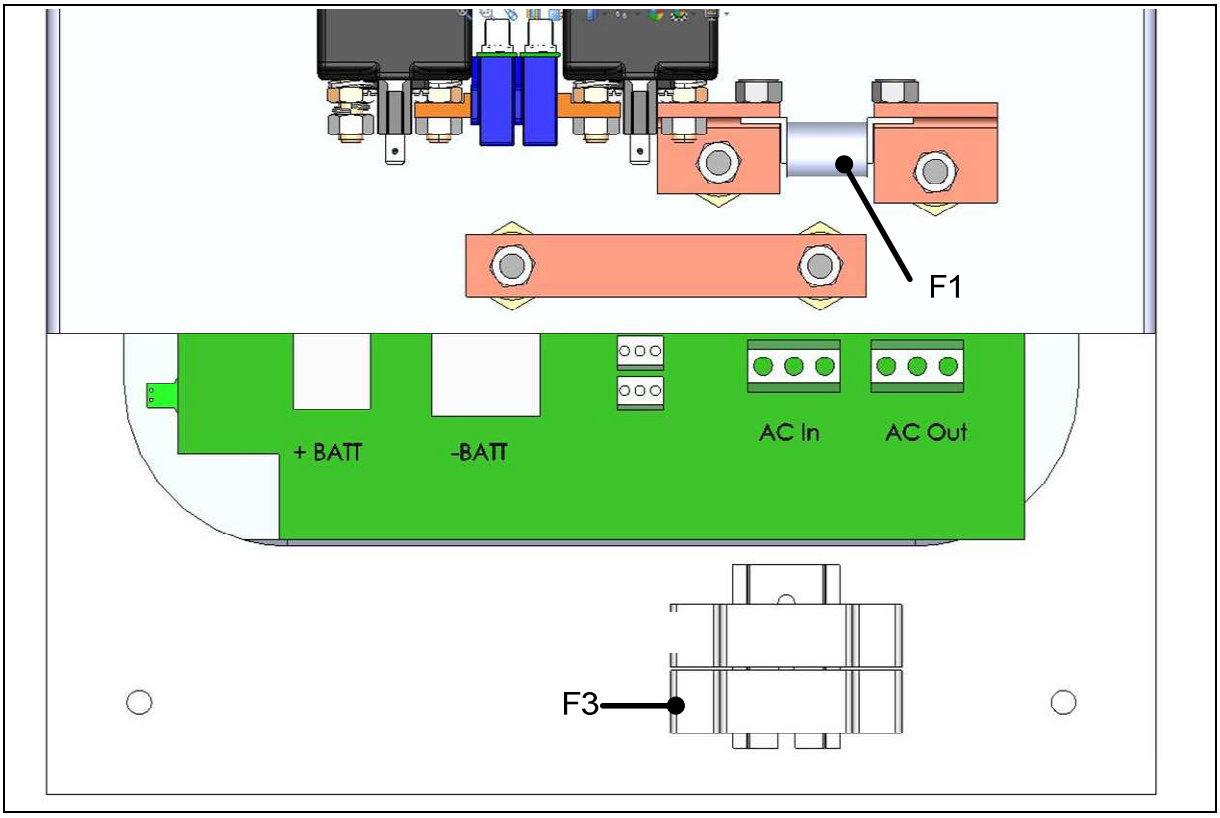


Fig 3.5

3.4.1 Fuse Values

DC Battery protection fuse, F1 = 160A
AC output fuse, F3 See table 3.2

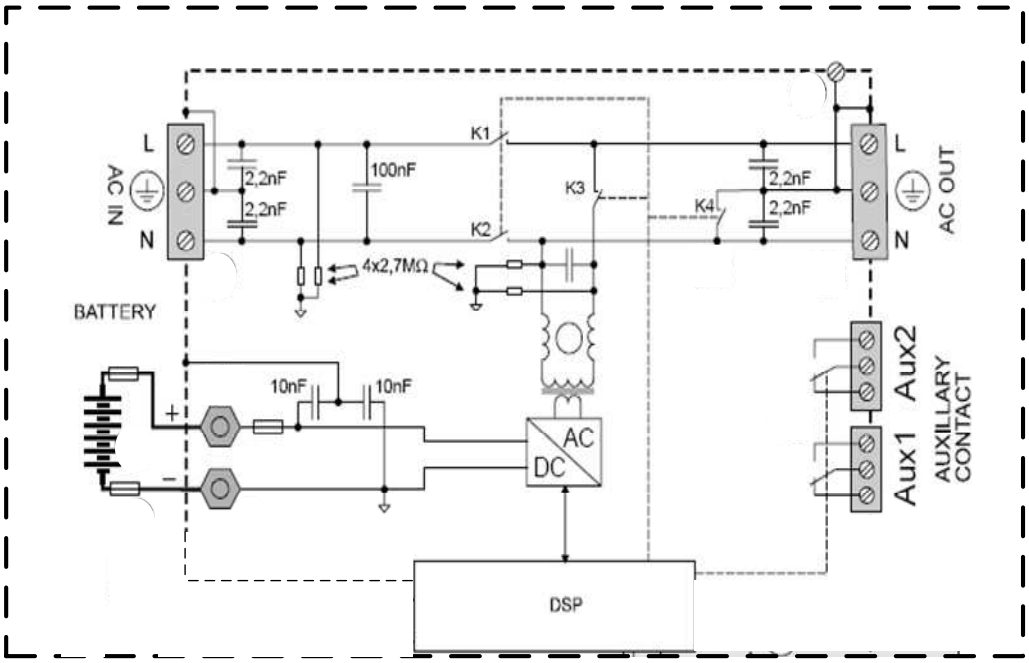
Output Power (kVA)	230V System Max AC output current (A)	120V System Max AC output current (A)
Up to 3000	15	30
Up to 2500	12	25
Up to 2000	10	20
Up to 1000	5	10

Table 3.2

Caution!	**Only the fuse values listed in the table above may be fitted to the iUPS101. Failure to fit the correct fuse will invalidate the ATEX certificate. Fuses must not be replaced without further investigation as to the cause of the failure. If in doubt, please contact Extronics**

4 Description and Functioning

4.1 Circuit Diagram



4.2 Description of the main functions

4.2.1 Overview

The iUPS101 contains two major components which work completely independently to each other to give a high performance industrial inverter charger with the additional protection required for charging of batteries in hazardous areas. The first component is the main UPS inverter charger as depicted in the circuit diagram above, and the second component the Extronics bespoke design battery charge protection circuitry.

4.2.2 Inverter

The IUPS101 is equipped with a high-performance inverter which supplies a perfect and very precise sine wave. Any unit designed for the 230 V/50 Hz electrical grid may connect to it without any problem, up to the rated power out of your IUPS101. The inverter is protected against overloads and short-circuits.

4.2.3 Battery protection circuit

This bespoke circuitry works completely independently to the UPS, providing a fault tolerant battery charge protection required as per EN60079-7:2007 for charging of batteries in a hazardous areas. Its function is to monitor the charging voltage and current from the inverter / charger to ensure they do not exceed dangerous limits advised by the battery manufacturer. In the event of battery charge failure the battery protection circuit will ‘trip’ causing the connection between the UPS and the batteries to be isolated and prevent any dangerous fault conditions transferring to the batteries.

4.2.4 Automatic load detection

In order to save battery energy, the IUPS101 inverter stops and automatically goes into load search when the detected load is lower than the sensitivity set by the configuration. It automatically goes back into operation when a power consumer greater than this value demands it.

4.2.5 Transfer relay

The IUPS101 can be connected to an alternative power source such as a generator or public network. When the voltage at the entry satisfies the voltage and frequency parameters, the transfer relay will be activated after a delay. This delay may be adjusted (extended) to allow a fully stable status of the generator before transfer.
When the transfer relay is activated, the voltage present at the input of the iUPS101 is available at the output for the consumers connected. At the same time the battery charger goes into operation.

Important	**When the transfer relay of the iUPS101 is active, the voltage at the output of the IUPS101 is equivalent to that which is present at the input and cannot be influenced or improved by the iUPS101. The consumers are supplied by the source present at the "AC IN" input via the transfer relay.**

The maximum current of the transfer relay is 50 A. The sharing of energy between consumers and the battery charger is adjusted automatically. The transfer relay will be deactivated when the input voltage no longer satisfies the voltage and frequency requirements at the input or when the current limit is exceeded. If the exceeding of this limit is prohibited, the UPS passes immediately into inverter mode. In this case the loads are supplied exclusively by the battery via the inverter. This switching always takes place automatically. The presence of increased dynamic loads (such as pneumatic angle grinders, etc.) may lead to an undesirable opening of the transfer relay due to the weakness of the source. To this case, a delay in the opening of the transfer relay can be adjusted. The transfer normally takes place without any interruption when the generator stops. It would typically be 40 ms in the event of the immediate loss of input voltage at "AC IN".

4.2.6 Fast voltage loss detection mode (fast transfer):

When the iUPS101 is connected to the public grid or to a generator supplying stable and clean AC voltage, a fast voltage loss detection mode can be used. In this mode, perturbation or lack of voltage of less than 1 millisecond can be detected, switching the unit in inverter mode immediately.
The sensitivity of this detection is adjustable. This mode guarantees a zero or maximum of 15 ms transfer time, and should not be used in presence of highly disturbed utility grid or with a low power generator or a generator supplying a poor quality voltage.

4.2.7 Battery charger

The battery charger for the iUPS101 is completely automatic and is designed in such a way as to guarantee an optimum charge for the lead-acid batteries. Once the transfer relay is activated, the battery charger goes into operation.
The battery charger is designed in such a way as to guarantee charging of the battery that is as complete as possible. The charging process is at four levels by default and guarantees optimum charging of the batteries. The charging current should not be adjusted from the supplied settings.

Important!	**In its default configuration the iUPS101 does not use constant current charging.**

Important!	**Alternative charge profiles can be set up by Extronics for the charging of NiCd batteries in accordance with battery manufacturers operating instructions.**

4.2.8 The inverter as source backup (“smart boost” function)

The UPS contains a smart boost function where the batteries can provide additional power to that of the source to increase the available output power; however this must remain disabled as this will cause the system to operate outside of its rated output power, and therefore invalidate the safety parameters of the ATEX certificate.

4.2.9 Battery protection

The battery is protected against deep discharge. When the battery has reached the low voltage disconnection threshold the inverter will stop. The inverter will restart automatically when the battery voltage has reached the restarting threshold.
This restarting threshold can be automatically readjusted if set to do so, in order to better protect the battery against repeated cycling in an "almost empty" state of charge. The restarting threshold is then incremented up to a maximum value, whenever the LVD (low voltage disconnection) is reached.
If the inverter is repeatedly encountering a low voltage disconnection in a short period, it will stop permanently and will only start again via an operator’s restart.

When the inverter has stopped permanently and there is no AC input supply, there will be a natural discharge of the connected batteries by the iUPS101 and internal battery safety monitoring circuitry.

In order to prevent situations which may cause the UPS to continually draw power from the batteries, a deep discharge protection module is included. In the event that there is no AC input voltage present on the iUPS101 for a period of 24hrs, the deep discharge protection module will disconnect the batteries from the inverter by deliberately ‘tripping’ the battery protection circuitry. This will cause the battery isolation relays to open and the system will shut down; requiring the user to reset the system to power the UPS back on.

IMPORTANT!	**For systems with periods of inactivity, such as a long shutdown or moving/storing a mobile system where the UPS is not in use and there is no AC mains supply. Users should remove the incoming AC and DC supplies to the system when not in use.**

WARNING!	**If the batteries are to be disconnected in a hazardous area, then an appropriately certified means of isolation must be provided.**

WARNING!	**All parts of the enclosure must never be opened while energised, or when an explosive gas atmosphere is present.**

4.2.10 iUPS101 protection

The IUPS101 is protected electronically against overloads, short-circuit, overheating and reverse current (cabling of a voltage source on AC out).
In the event of overload or short-circuit at the output, the inverter stops for some seconds and restarts. If the inverter is repeatedly encountering this situation in a short period, it will stop permanently and will only start again via an operator's manual control.
If the battery voltage exceeds the programmed value the inverter stops and starts up again when the voltage is less than the set level. If the iUPS101 is repeatedly encountering this situation in a short period, it will stop permanently and will only start up again via an operator's control.

Important:	**Overheating of the UPS due to operation in increased ambient temperature or rated loads above those specified for your product may lead to overheating of certain internal components of the unit. In this case, the device will automatically limit its power output as long as this abnormal situation persists.** **The IUPS101 is protected from reverse polarity by means of a fuse installed within the Ex 'd' enclosure.**

4.2.11 Auxiliary contacts

The iUPS101 has two dry reversing contacts that are potential-free. The status of the contacts in idle mode (deactivated) is indicated by the annotations, N.C. = normally closed and N.O. = normally open.
Maximum contact loads: 230 Vac / 24 Vdc: 16 A or: max. 50Vdc/ 3A
These dry contacts are programmed by default for the following functions:

Contact no. 1 (AUX 1): The contact has a function of automatic start of generator (two wires). The contact will be activated when the battery voltage is below a set value, during a given time. The contact will be deactivated when the charge cycle as reached floating, or when the Aux. 1 deactivation voltage is reached.

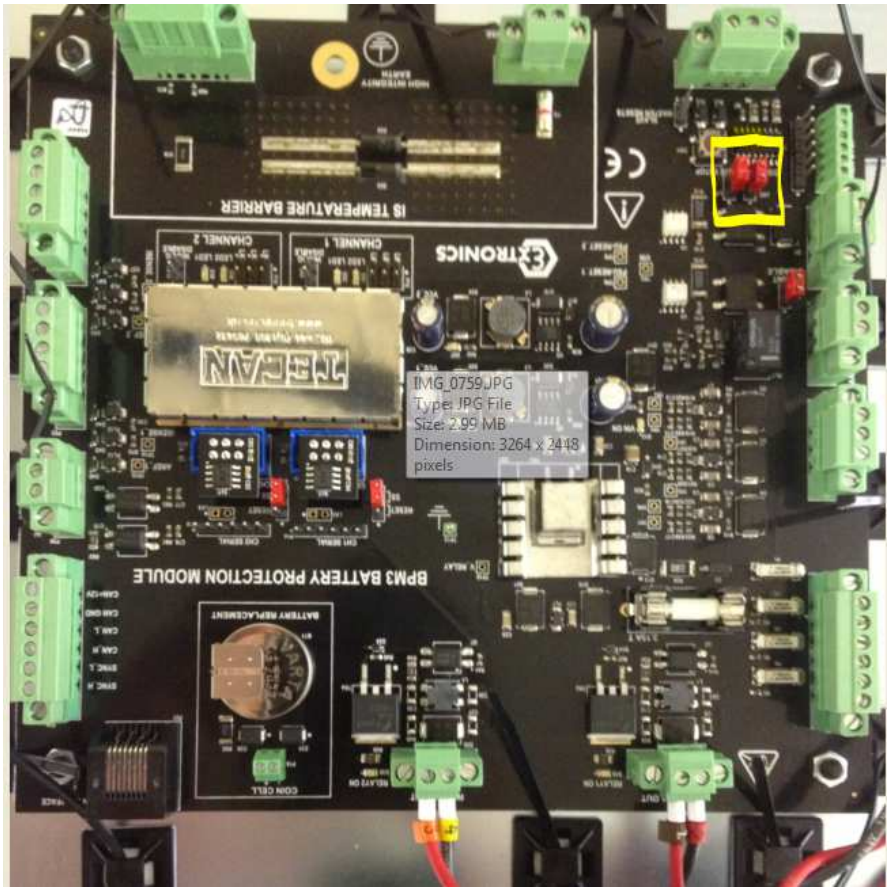
Contact no. 2 (AUX2): Alarm contact by default. It is deactivated when the inverter is out of service or is working at reduced performance, either because of manual control or if there is an operational fault such as overload, under-voltage of the battery, over-temperature, etc.
The functions of the two auxiliary contracts can be modified and programmed variously – contact Extronics for details

If the operator or installer requires different behaviour for the auxiliary contacts, they are both freely and individually programmable depending on the battery voltage and the inverter status and the internal clock. The intelligent programming of the auxiliary contacts allows many applications to be considered such as:
Automatic start-up of the generator (two or three wires)
Automatic load shedding of the inverter (2 sequences)
Global or individual alarm
Automatic disconnection (load shedding) of the source

4.2.12 Remote Emergency Disconnect

	Note: This is a comprehensive signal and leads to the stoppage of the iUPS101

Important:	**This function is disabled by default, and can only activated by the removal of Jumper links LK2 and LK3 on the battery protection PCB contained within the Ex'd' enclosure of the iUPS101. See Fig 4.1 below for location of the jumper links.**



The remote emergency disconnect allows users to deliberately ‘trip’ the battery protection circuitry, which will disconnect the batteries from the UPS and shuts the system down. This should only be done in the event of an emergency that requires the AC supply to the load to be removed. The remote emergency disconnect signal is a ‘hot’ 24-48Vdc supply provided by the user. If the remote emergency disconnect function is enabled, failure to provide this signal will prevent the iUPS101 from powering on. Similarly, removal of the signal will cause full system shut down and loss of supply to the connected load. Details for the connection of this signal can be found in section 3 of the manual.

5 Operation

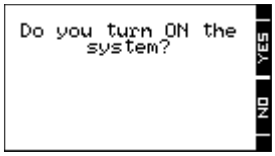
5.1.1 Powering up the installation

The power up of the iUPS101 must be carried out in the order given below. Any power off must be carried out in the reverse order.

Initially, the display will be blank. Press the reset button on the front panel (See Fig 4.0) - this will close the contactors within the UPS, and connect the batteries. The green ‘battery healthy’ lamp should illuminate, and the display should come on. You can now power on the AC input to the UPS.

5.1.2 Activating and deactivating the iUPS101

When one of the displays is visible, it is possible to activate or deactivate the IUPS101. To do this, simply press the key ESC. The key request on the screen indicates whether you are going to activate or deactivate the unit.
Once the key has been pressed, you must confirm your choice by using the key YES. If you do not want the action to be carried out, it can be cancelled by pressing the NO key.



	Note: This is a comprehensive signal and leads to the stoppage or starting of all iUPS101s connected to the remote control.

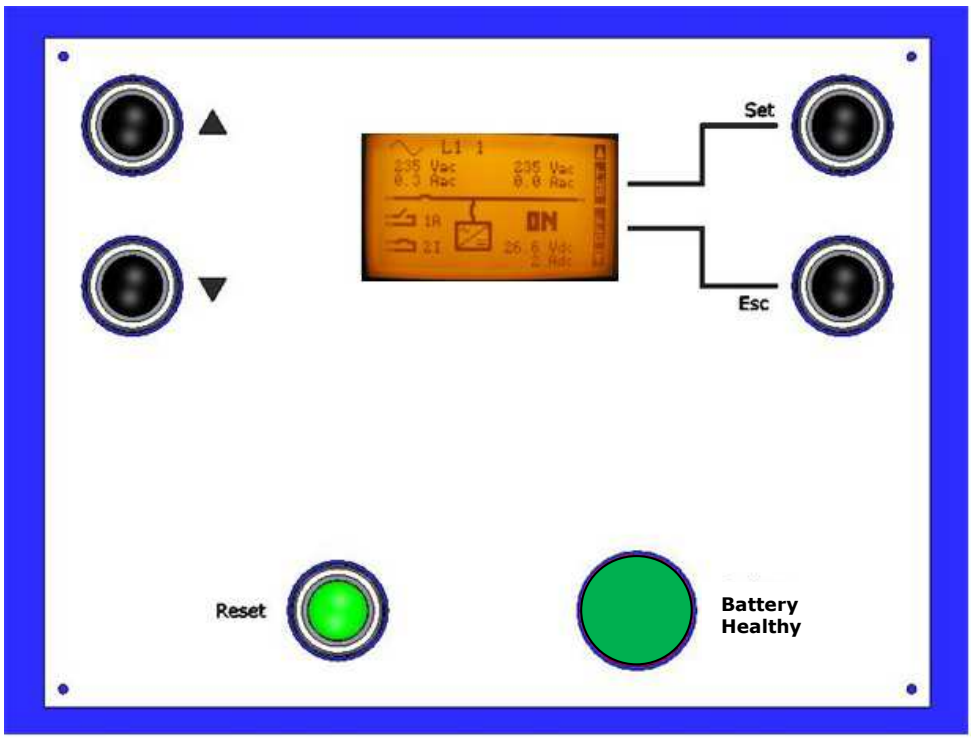


Fig 4.0

There is no need to configure any settings for charge voltage and current, as these are already programmed into the iUPS101 by Extronics, depending on the battery configuration and rated load.

Warning!	**At no point should the battery charge current be altered without consulting Extronics**

During normal operation, the Battery healthy lamp should remain illuminated. If this extinguishes at any point, this indicates the connection between the UPS and the batteries has been interrupted either for safety reasons, or there is a fault with the system.

5.1.3 Status Information

The display shows charging and load information during normal operation. See Fig 4.1

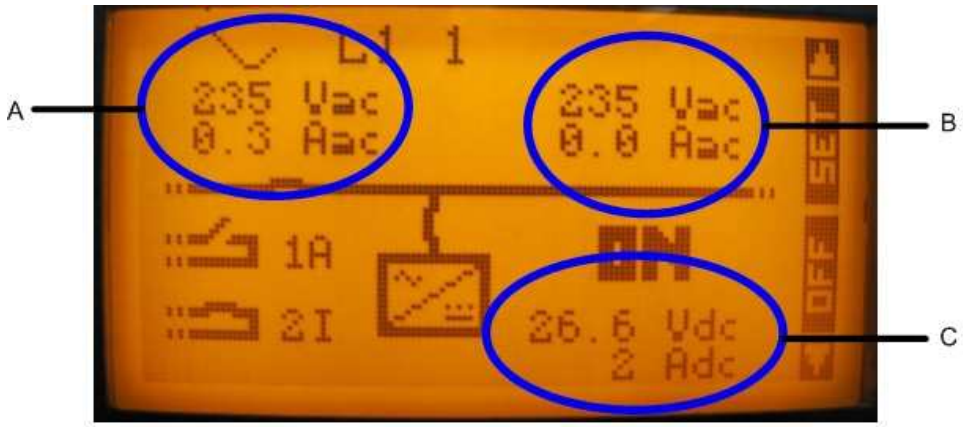


Fig 4.1

A- Shows Information on the AC Input
B- Shows Information on the AC Output
C- Shows Information on the battery

The display will also show information on a fault should one occur.

There is an Expert user level for advanced programming and configuration of the UPS and auxiliary contacts. See the advanced programming section in this manual.

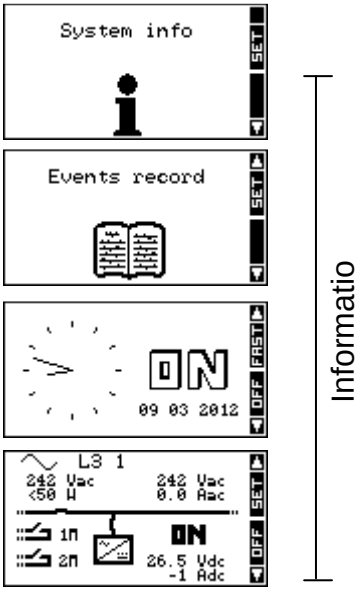
5.1.4 Basic displays

When the remote control is connected to an IUPS101, it is possible to access to different display menus divided into distinct categories.

Information on the system

The history of events occurring in the installation

Real time information displays on the operating mode of the installation

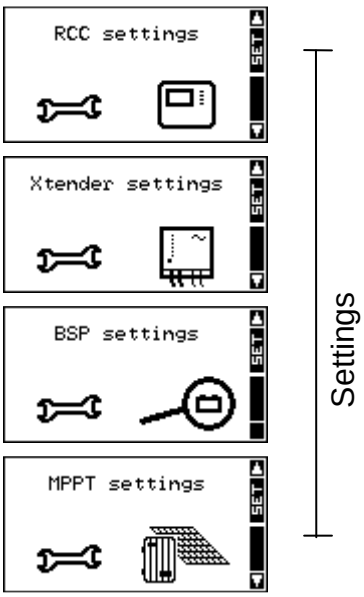


Adjustment of RCC remote control options

Adjustment of configurations on the IUPS101(s)

The settings of the BSP
(Only if a BSP is present)

The settings of the MPPT
(Only if a MPPT is present)

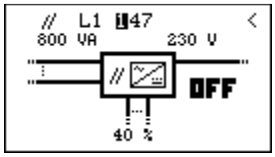


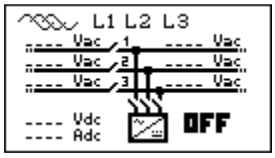
To go from one display to the other, use the keys UP and DOWN on the front of the system.
To visualize or modify the options of one of the basic displays, press the key SET when this one is displayed.

	Depending on the components connected to your system, it is possible that other displays complete this series.

In the case of a system in 3-phase or in parallel, the following displays are available too:

Real time display of information on the state of running of the installation





6 Advanced Programming

The iUPS101 visual display, and Ex'd' buttons give you access to a many settings and possibilities. However, it is important that user understands that this programming should only be performed by a competent engineer, as changes can be made that will impair the safety of the system. In most cases the only parameters that will need setting are the Auxiliary alarm contacts.

6.1 Adaptation to the source

These values have been programmed by Extronics, and do not need to be altered.

6.2 Adaptation to the battery

Charge current {1138}

This has been programmed by Extronics to suit the batteries supplied with your system, and should not be changed under any circumstances.

6.3 Activation of the function Smart-Boost

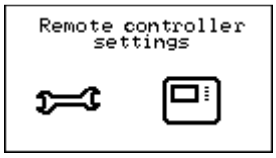
This function has been disabled by Extronics and should not be activated under any circumstances. Failure to comply with this could impair the safety of the system and allow the maximum output power to exceed its rated value.

6.4 Adjusting the AC Output Frequency {1112}

This setting allows you to alter the output frequency of the inverter of the iUPS101. This setting changes the limit frequencies on the charger's synchronization.

6.5 Setting of the RCC remote control

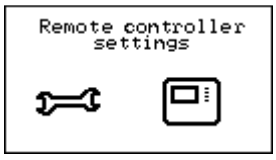
This screen gives you access to the remote control basic settings. From one of the basic menu items, use the keys UP and DOWN until reaching the item “Adjustment of the remote control”, then confirm by using the key SET.

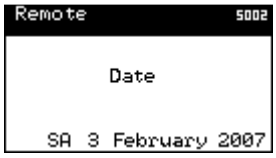


When the item to be modified appears on the screen, press the key SET to be able to modify it. This value then displays in inverse video. Now use the keys UP and DOWN to modify it. Once the correct value has been obtained, confirm by using the SET key or exit without modifying by using the key ESC.

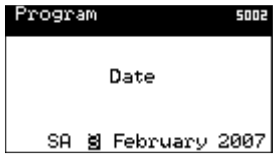
	Each configuration has a unique ID displayed top right (see example below) these numbers are indicated between curly brackets in this manual : {xxxx}

EXAMPLE to modify the current date
Go to the following screen using the UP and DOWN keys.
Press the key SET to access the remote control adjustment.
Go to the following screen using the key DOWN.
Press the key SET to modify the configuration





Set the correct date using the keys UP and DOWN
Go to the adjustment of the month using the key SET
Also set the month using the keys UP and DOWN
To complete, go to the year adjustment using the key SET
After having adjusted the year using the keys UP and DOWN, confirm using the key SET.



6.6 Setting of the language {5000}

The default language is English and the IUPS101 can store up to four languages simultaneously. This configuration allows you to choose one of them.

6.7 Setting of time {5001} and date {5002}

The IUPS101 has a perpetual calendar and an internal clock powered by a backup battery. The correct adjustment of the date and time allows accurate recording of events occurring in the installation as well as correct use of time-related functions, e.g. the disabling of the auxiliary relays during the night.

6.8 User level {5012}

The setting of the user level allows you to choose the access to the IUPS101 according to your level of expertise.
The **INFO ONLY** level may be selected by entering the code:

460081

This level does not allow the IUPS101 configurations to be modified; it only allows information to be displayed on the system.

	Use the INFO ONLY level after adjusting the configurations if the remote control is located in a public place or if it is accessible by people who are not authorized to carry out adjustments on your system. You may change the level at any time to make new adjustments, by entering the appropriate code.

The **BASIC** level allows you to configure basic IUPS101 functions, limiting the field of actions to simple configurations. Please note that the incorrect adjustment of basic configurations may lead to the malfunctioning of the installation. This level is selected by default. To return to this level after a change, enter code:

943274

The **EXPERT** level allows access to more complex IUPS101 configurations and this level of usage may only be used with extensive specialist knowledge. To access the expert level, enter code:

426468

6.9 Drive the remote control to the user level basic {5019}

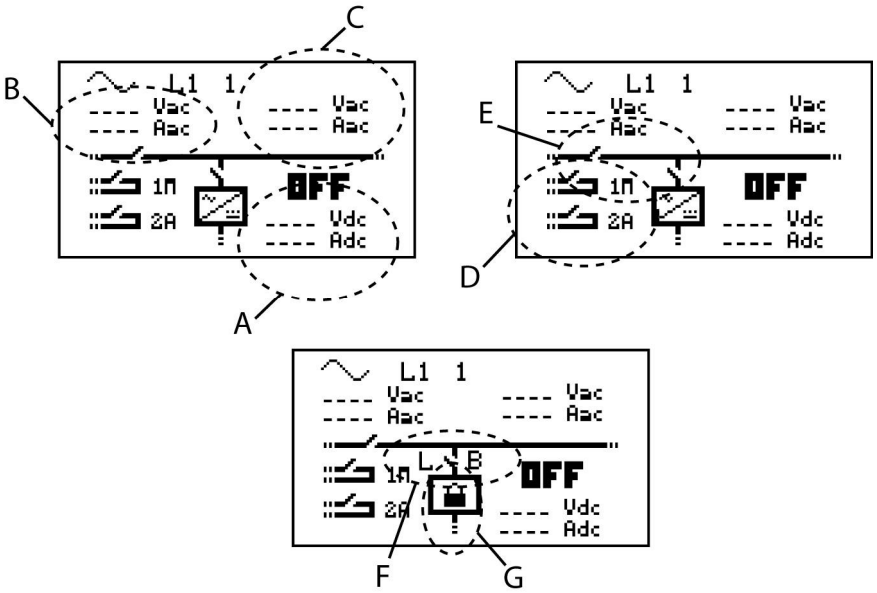
You can with this option bring the remote control back to the level “user Basic”.

6.10 Information on the operating mode of the installation

There are two different views for displaying information on the system: a simplified and a configurable display. When one of these two displays is visible, it is possible to activate or deactivate the system. For further information, please refer to the paragraph on activating and deactivating the combi IUPS101.

The simplified display only indicates the current time and the mode of the IUPS101 (ON or OFF)

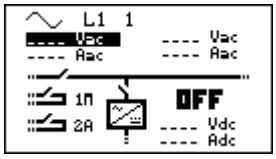
The configurable display shows the system in its entirety, represented by a synopsis of distinct information blocks.



A Information on the battery
B Information on the grid input
C Information on the grid output
D Information on the auxiliary contacts
E Information on the transfer and output relays
F Information on the state of the maximum current of the source (Input limit) (L) and of the Smart-Boost (B: Boost activated, L: input limited)
G Information on possible locking of the function (G)

Two pieces of information related to blocks A, B and C may be viewed simultaneously. To change displayed information, proceed as follows:

Press the key SET (one of the pieces of information is displayed in reverse video).
Go to the value to be changed by using the UP and DOWN keys.
Enter into modification by using the key SET. You may now view the values that can be displayed in this area.
Using the keys UP and DOWN, select the new information that you want to see appearing.



Confirm your selection by using the key SET.

To escape at any time, use the key ESC to return to the starting display.
The following information is available:

With regard to the grid input

AC In input voltage
AC In input current
AC In input power
Input frequency
The value of the source max current (Input limit)
Energy from AC-In of the previous day
Energy from AC-In of the current day

With regard to the grid output

Output voltage
Output current
Output power
Output frequency
Consumers energy of the previous day
Consumers energy of the of the current day

With regard to the battery

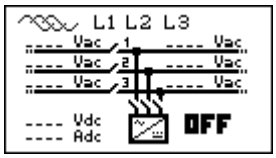
Battery voltage
Actual charge current of the batteries
Programmed charge current
Ripple voltage of the batteries
Charging phase (bulk charge, absorption, float charge, etc.)
Dynamic compensation of the battery (compensation of the thresholds due to the internal resistance of the battery)
Operating mode (inverter, charger, etc.)
Battery temperature (if a sensor is present)
The battery temperature's inherent compensation (if a sensor is present)
Discharge of battery of the previous day
Discharge of battery of the current day
Remaining time of the phase of absorption, equalization or reduced absorption
State Of Charge of the battery (SOC) (if a BSP is présent in the system)

If a piece of information is not available, the screen displays - - - -.
Information on the auxiliary relays as well as the output and transfer relays appears as open or closed in the synopsis according to their current state.
Auxiliary relays are indicated with their corresponding number as well as the letter A if they are operating in automatic mode and M if they are controlled manually.
Other letters may be displayed with regard to specific programming. Please refer to the corresponding chapter.
The general operating mode of the combi IUPS101 is displayed in large letters on the two visualisation screens (ON or OFF).

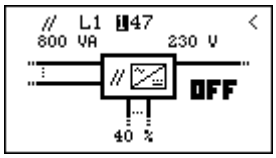
6.11 Display of the parallel and three-phase systems

While using several IUPS101s in parallel or in three-phase, an additional view is available. This view summarizes the various electrical values of the system. Like for the display of a system with one single IUPS101, you can access to the displayed values in order to modify them.

Each summarized view gives access to the display of one IUPS101.



In the view of the three-phase, you have access to the detail of one phase by pushing the key SET and then, by pushing UP or DOWN, you can choose the phase you want to see displayed in details.



If the phase consists of several IUPS101s in parallel or if the system is a single phase one but with several IUPS101s in parallel, you can then have access to the display of each IUPS101 by selecting in the view parallel one of the three available inverters.

7 Messages and account of events

This screen allows you to view the various events that have occurred in the installation.

The events that occur in your installation are displayed on the remote control screen.
The events are classified within two categories:
The events that may have serious consequences are displayed up to the moment where the user confirms that he has taken note of them by pressing on an RCC remote control key. These events are recorded in the event history and may be consulted subsequently.
Events not posing a risk are indicated briefly on the display and then disappear. Some are recorded in the event history.
On the other hand, the messages may have different origins and they are preceded by an attribute to enable you to understand the importance:
Message: normal event but one that conditions or influences the operation of the IUPS101.
Error: an event that prevents the correct or normal operation of the IUPS101.
Alarm: an event that may cause a malfunction of the installation if it is not corrected.
Stop: The system had to be stopped as a major event is preventing its operation.

⚠	Caution, a stop can be temporary and the system can restart automatically. In case of work on the installation, switch off the system.

INSTALLER - In the message history, you may clear the list of saved messages. The clear function is signalled by 'CLR', opposite the SET button. You must confirm to clear the list of messages.

ℹ	Use this function, for example, after maintenance visit or when completing the commissioning of the installation.

7.1 (000) Alarm: Low battery voltage

The battery is almost completely discharged. If the situation persists, the inverter function of the IUPS101 will be deactivated.
Solution:

- recharge your battery as soon as possible
- recharge your battery more frequently
- increase the power or the energy available for the load (for instance with more solar panels)

ℹ	This message is generated in conjunction with the undervoltage of the battery configuration {1108}.

ℹ	The service life of the batteries is greatly conditioned by their state of charge. Prolonged or repeated operation at a low charge may cause damage. With the Smart-Boost function activated, it is also possible to discharge the batteries even if connected to a source of energy.

7.2 (003) Message: AC IN synchronization in progress

A valid voltage has been detected on the AC IN input and the IUPS101 is synchronizing. Once synchronized, the consumers will be transferred to it and the battery will be charged.

	Note: It is possible to prohibit the transfer or the battery charging.

7.3 (004) Message: Wrong AC-In input frequency

The voltage at AC IN does not have a frequency included in the admissible range for the IUPS101.
Solution: When operating on a generator, check its speed.

	If you are not equiped to measure the generator frequency, measure its voltage with no load. Indeed, if the voltage is correct, the frequency is generally correct as well.

7.4 (006) Message: Too high AC-In input voltage

The voltage at the AC IN is too high for the IUPS101 and represents a danger for the consumers; the transfer relay is not activated.
Solution: Reduce the voltage on the AC IN input to come into an admissible range.

7.5 (007) Message: Too low AC-In input voltage

The voltage at AC IN is too low for the IUPS101. The transfer of consumers and battery charging are not activated.
Solution: Reduce the voltage on the AC IN input to come into an admissible range.

	Do not increase the voltage of the generator during the battery charging or when the consumers are connected to it: If the consumers stop, an overvoltage may arise which will destroy components of your installation.

	If the transfer of the consumers is carried out and the message appears some seconds after the start of the battery charging, check that you have not adjusted the charging voltage of the batteries too high in relation to your source. Also check the adjustment of the maximum current of the source (Input limit) configuration {1107}.

7.6 (008) Stop: Overload inverter SC

The consumers require more power than the IUPS101 inverter can supply.
Solution:

- Adapt the maximum power output of your consumers to the maximum power output of the IUPS101
- . Check that the cabling is not short-circuited.

7.7 (014) Stop: Overtemperature EL

The IUPS101 stops due to overheating.
Solution:

- Check that the ventilation holes of the IUPS101 are not obstructed.
- Check that the IUPS101 is not situated in a place where the ambient temperature is too high.
- Adapt the power max. of the users to the nominal power of the IUPS101 according to the ambient temperature.

⚠	The over temperature is disadvantageous for the service life of certain electronic components. If the stoppages due to over temperature happen frequently, corrective measures will be required.

7.8 (015) Stop: Overload inverter BL

The users need more power than the IUPS101 inverter can supply.
Method:

- adapt the power max. of the users to the power max. of the IUPS101.

7.9 (016) Alarm: Ventilation fault detected

A dysfunction of the ventilation has been detected; get it checked by a technical staff.

7.10 (018) Alarm: Excessive battery ondulation

The voltage ripple at the battery cables is too high.
Solution:

- Check that the battery cable section is correct.
- Check the tightness of the battery cables.
- Check that the charge current matches your battery.
- Check the state of your batteries.

ℹ	The use of batteries of an inappropriate capacity may also cause this error message. In this case, reduce the charge current or lower the power output of the consumers.

⚠	The voltage ripple on the batteries may be caused by their ageing. In this case, lower the charge current.

7.11 (019) Stop: Too low battery voltage

The functions inverter and Smart-Boost of the IUPS101 are deactivated because the batteries are discharged.
Method: recharge your batteries to reactivate these functions automatically.

7.12 (020) Stop: high battery voltage

The voltage of the battery at the IUPS101 DC input is too high. The system is stopped for security reasons.
Method: check that the battery nominal voltage suits the IUPS101 one.

In case of an external charger, check that it charges the batteries with a voltage suitable for the IUPS101.

7.13 (021) Message: Maximum Current of the source (Input limit) exceeded; transfer prohibited

The power output of the consumers exceeds the one specified for the source, and the transfer relay cannot be activated. The IUPS101 operates in inverter mode.

- This situation occurs only if you have deactivated the parameter {1436} Solution:
- Check that the configuration of the maximum current for the source {1107} corresponds to the maximum current of the source connected at AC In.
- Reduce the number or power output of the consumers.

⚠	In this case, the transfer relay is not activated and the recharging of the batteries cannot take place. If this situation continues, you might discharge your batteries.

7.14 (022) Error: Voltage at AC Out

An unwanted voltage is present at AC Out.
Solution:

- . check that you have not reversed the cabling of AC input and output.
- . no source must be connected to the IUPS101 output (AC-Out).
- . check the cabling of the installation.

7.15 (023) Error: Phase not defined

The jumper of phase selection (L1, L2 ou L3) is missing on the IUPS101.
The IUPS101 cannot operate without the phase being defined.
Solution: Check the phase definition jumper in the cable connection zone.
Refer to the IUPS101 manual for more information.

7.16 (024) Message: Control the battery of the clock

The maintenance battery is discharged. To avoid the clock goes back to zero in case of a blackout, its replacement is necessary. Refer to the IUPS101 manual for this replacement.

7.17 (041) Alarm: Overtemperature TR

The temperature of the IUPS101 is excessive and the output power is limited.

ℹ	This message can also occur after a long operation in a too hot environment.

7.18 (042) Stop: Source at the output

A source of energy has been detected at the AC-Out output and supplies current to the IUPS101.
Method: check that you do not have a source of energy connected to the output.

	If it is wished to have a supply on the output side (back-feeding) adapt the parameter {1438}. Only the sources meant for such feeding and synchronized can be used.

	For an operation with a grid feeding inverter the load of this inverter can also be controlled, see parameters {1438}, {1536} and {1549}.

	In no case will the feeding source power be bigger than the IUPS101 power.

7.19 (058) Error: Lost of synchro master

A communication problem between the IUPS101s is detected.
Method: check the cabling in betwen the IUPS101s.

7.20 (059) Stop: Overload inverter HW

See code (015)

7.21 (060) (061) Alarm: Maximum duration security for auxiliary contact

The maximum duration that you have selected for the relay activation with the parameter {1514}, {1515} is reached and the activation conditions are still present. The contact will not be reactivated as long as the conditions are present. Therefore there is a risk that the auxiliary contact remains locked in this position unless you reset this alarm.
Method: reset manually this alarm with the corresponding parameter ({1512}AUX1, {1513}AUX2) by deactivating and then activating it.

	Use this function with care and only as a security.

7.22 (062) Alarm: Genset problem, no AC-In after a start by means of the auxiliary contact

The genset start has been driven by the auxiliary contact but there is no voltage at the IUPS101 input.
Method: check that the genset runs and that its connection to the IUPS101 has not been interrupted.

7.23 Stored events

Events are stored in the remote control. Any system not permanently connected to a remote control does not store the events.

To access the event history via one of the basic displays, change the screen by using the keys UP and DOWN until the “event history” screen appears and then validate using the key SET.
The number shown at the top right indicates the message number. In a system with several IUPS101s, the events are presented in chronological order and the lower line indicates the IUPS101 to which the event refers.
Each event is recorded as well as the date and time of its occurrence. The keys UP and DOWN allow you to view all the events that have occurred.
Where there is a system with multiple IUPS101s, each message also contains the number of the IUPS101 that has generated the message.
Quit the message display by using the key ESC

7.24 Utilisation and access levels

The functions described below refer to the EXPERT level. Depending on the user level selected, access to all the functions may not be possible. Refer to the chapter on setting the user level of the remote control for more information on this subject.

7.25 Pre-defined functions of the auxiliary relays

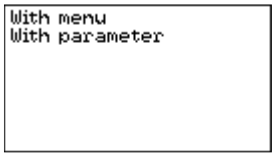
The two auxiliary relays (dry contacts) of the inverter-charger IUPS101 are already programmed with factory settings and can be activated with various functions. They react to different signals.
The factory settings depend on the IUPS101 models.
For more information on the auxiliary contacts pre-set functions, please see the inverter-charger IUPS101 manual.

	Caution, if your installer or supplier has done pre-settings, these pre-set functions may have been changed.

7.26 Access to the parameters

You can access to the parameters by two different ways:

- By its parameter number;
- Via the the main menu.



7.26.1 Access to a parameter by its number

Each IUPS101 parameter is directly accessible by its unique reference number. This function can be used in order to change the value of a parameter or to consult its set value.
If you know the reference number of a parameter that you want to change, you can access to it directly with this menu. Move with the keys UP and DOWN to highlight the parameter then select it by the key SET. You have then the possibility to change the value of this parameter.
For each parameter, its set value is written opposite to it. If a parameter does not have a value displayed, this means that you do not have the user level required to change the value or that the parameter does not have a value (a menu title for instance).
When you want to access to a parameter which access level is superior to yours, it is possible to do it only with a code: select the parameter that you want to change with the keys UP and DOWN then press the key SET. The remote control then displays a 4 digits number. By communicating this number to your installer, you can receive an activation number which will allow to modify the wanted parameter.
The key received is valid only for one single access to the wanted parameter. This is why it can be necessary to be online with your installer when it comes to do several changes.

7.26.2 Access to a parameter via the menu

The IUPS101 configurations are divided into several categories:

- Basic configurations
- Battery and its charge cycle configurations
- Inverter configurations
- The parameters of charger and input signals
- First auxiliary contact configurations
- Second auxiliary contact configurations
- Auxiliary contact extended function configurations
- The parameters of the system
- Three-phase or parallel operation configurations
- The parameters of grid feeding

According to the user level selected, it is possible to access several hundred configurations. For this reason, each configuration has a unique ID displayed top right. In the event of questions on the subject of a configuration, ensure that you have this number at hand.

When you modify a configuration, a star is displayed to the left of the value if it corresponds to the factory-set value.
The various configurations can be adjusted within a large range. Nevertheless, some configurations are interdependent and cannot be adjusted beyond the value of other configurations. You can consult the list of dependencies on the list in appendix 1.

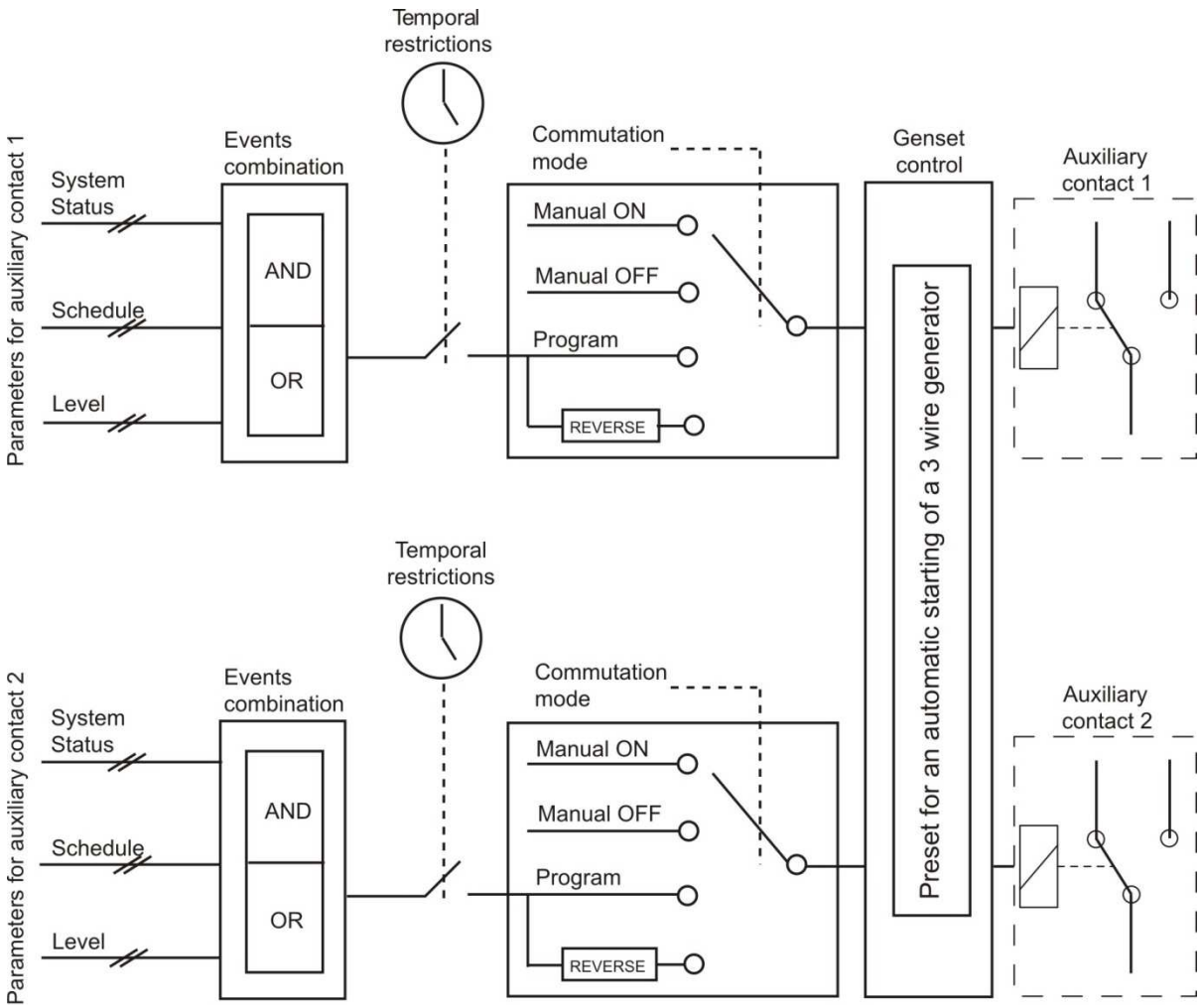
8 Configuration for auxiliary contacts 1 and 2 {1201} {1310}

The IUPS101 inverter/charger is equipped with two auxiliary relays each with one free of potential contact (reverser). These two relays allow multiple functions to be carried out by using adequate cabling as well as simple programming.
The programming of each contact is carried out independently except when conditions require the use of two relays. In this case, the programmed events for activating the second relay are automatically deactivated.
The extended functions of the auxiliary contacts are described at the end of the chapter on simple functions.
The auxiliary contacts are activated immediately in response to the programmed signals. When the activation conditions are no longer fulfilled, they are deactivated with a delay of 2 seconds to avoid overswitching.
The auxiliary contacts respond to various signal types presented graphically below.
The following types of basic events may activate the contacts:

- Simple event
- Scheduled event
- Level

In the following description, each parameter has two reference numbers. The reference on the left relates to auxiliary contact 1 and the reference on the right to auxiliary contact 2 ({reference of the auxiliary contact 1} {reference of the auxiliary contact2}).

	The auxiliary contacts are factory set with pre-defined functions. If you wish to implement a specific function you must clear the programming already set. Use for that purpose the prarmeter {1569} or {1570}.



8.1.1 Simple functions

8.1.1.1 Switching mode {1202} {1311}

The auxiliary contacts may be controlled in 4 different ways:
Manual ON: In this mode, the contact is permanently drawn whatever the external conditions or programming
Manual OFF: In this mode, the contact is permanently released whatever the external conditions or programming
Automatic: In this mode, the auxiliary contact is activated according to the conditions and restrictions of its programming.
Reversed automatic: In this mode, the conditions and restrictions define the release of the contact.

8.1.1.2 Combination of events mode {1497} {1498}

This configuration defines how the various events intended to activate the auxiliary contact are combined.
Either a single event suffices to activate the contact (OR function) or it must have all the active events in order for the contact to be activated (AND function).

8.1.1.3 Temporal restrictions {1203} {1312}

These configurations allow the time frame to be defined in which the contact should under no circumstances be activated. Three distinct schedules are accessible in the form of restriction programs (programs 1 to 3). For each program, it is possible to select the day of the week where the restriction is activated. If the day is selected it appears on the screen and if it is not selected it is represented on the screen by two horizontal lines.
Once the days are selected, it is necessary to adjust the time frame where the restriction is active using the “starting time” and “finishing time” configurations. If the finishing time is programmed before the starting time, the restriction time frame is not taken into account. Below are the configurations with their references:

Program 1 {1204} {1313}
- Days of the week {1205} {1314}
- Starting time {1206} {1315}
- Finishing time {1207} {1316}

Program 2 {1208} {1317}
- Days of the week {1209} {1318}
- Starting time {1210} {1319}
- Finishing time {1211} {1320}

Program 3 {1212} {1321}
- Days of the week {1213} {1322}
- Starting time {1214} {1323}
- Finishing time {1215} {1324}

INSTALLER - Program 4 {1216} {1325}
- Days of the week {1217} {1326}
- Starting time {1218} {1327}
- Finishing time {1219} {1328}

Program 5 {1220} {1329}
- Days of the week {1221} {1330}
- Starting time {1222} {1331}
- Finishing time {1223} {1332}

	If your installer has made additional adjustments, it is possible that the restrictions could be active even if they do not appear in one of the three programs available to you.

8.1.1.4 Contacts activated with set schedules {1269} {1378}

The auxiliary contact can also be activated like a programmable clock. Three different weekly programs are available.
For each program, the time frame may be applied to one or several days of the week. If the finishing time is programmed before the starting time, the time frame is not taken into account.

Program 1 {1270} {1379}
- Days of the week {1271} {1380}
- Time of start of activation {1272} {1381}
- Time of end of activation {1273} {1382}

Program 2 {1274} {1383}
- Days of the week {1275} {1384}
- Time of start of activation {1276} {1385}
- Time of end of activation {1277} {1386}

Program 3 {1278} {1387}
- Days of the week {1279} {1388}
- Time of start of activation {1280} {1389}
- Time of end of activation {1281} {1390}

8.1.1.5 Contacts activated by an event {1455} {1456}

The auxiliary contacts may be activated by the states or events occurring in the installation. Each event may be combined with another to establish complex functions.

8.1.1.5.1 IUPS101 OFF {1225} {1333}

The contact is activated if the IUPS101 inverter/charger is switched off, either following a fault or manually.

8.1.1.5.2 IUPS101 ON {1518} {1519}

The auxiliary contact is activated if the IUPS101 inverter/charger is switched on.

8.1.1.5.3 Remote ON/OFF input active {1543} {1544}

The auxiliary contact is activated if the Remote ON/OFF input is active.

8.1.1.5.4 Battery undervoltage alarm {1226} {1334}

If the undervoltage threshold is reached, this activates the contact. In contrast to the acoustic alarm that is deactivated after a set time, this signal remains active as long as the battery voltage is below the threshold. If the undervoltage fault cuts in, this condition remains active as does the contact.

8.1.1.5.5 Battery overvoltage {1227} {1335}

Activates the contact in the event of battery overvoltage.

8.1.1.5.6 Inverter or smart boost overload {1228} {1336}

Activates the contact in the event of an error due to excessive power in the inverter or the Smart Boost function. In the event that the inverter disconnects due to excess power and it is attempting to restart, the contact is not activated until the end of the attempts.

8.1.1.5.7 Overtemperature {1229} {1337}

Activates the contact in the event of overtemperature in the electronics or the transformer.

8.1.1.5.8 No overtemperature alarm {1520} {1521}

Activates the auxiliary contact if no overtemperature alarm is active.

8.1.1.5.9 Active charger {1231} {1339}

Activates the auxiliary contact if the charger function is active. When the Smart-Boost function is operating, the condition for activating the contact is not fulfilled.

8.1.1.5.10 Active inverter {1232} {1340}

Activates the auxiliary contact if the inverter function is active.

8.1.1.5.11 Smart-Boost active {1233} {1341}

Activates the auxiliary contact if the Smart-Boost function is active. For more information on the smart boost function, refer to the manual for the IUPS101 inverter/charger.

8.1.1.5.12 AC In present with fault {1234} {1342}

Activates the auxiliary contact if there is voltage present at the AC In input but this voltage does not fulfil the conditions for activating the transfer relay.

8.1.1.5.13 AC In present {1235} {1343}

Activates the auxiliary contact if a voltage is present at the AC In input. This condition is independent of the state of the transfer relay.

8.1.1.5.14 Transfer relay drawn {1236} {1344}

Activates the auxiliary contact if the transfer relay is drawn.

8.1.1.5.15 AC Out present {1237} {1345}

Activates the auxiliary contact if a voltage is present at the output of the IUPS101 inverter/charger.

8.1.1.5.16 Battery charging in bulk charge phase {1238} {1346}

Activate the auxiliary contact if the battery is in bulk charge phase.

8.1.1.5.17 Battery charging in absorption phase {1239} {1347}

Activates the auxiliary contact if the battery is in absorption phase. If the periodic extended absorption function is activated, the contact is also activated in this phase.

8.1.1.5.18 Battery charging in equalization phase {1240} {1348}

Activates the auxiliary contact if the battery is in equalization phase.

8.1.1.5.19 Battery charging in floating phase {1242} {1350}

Activates the auxiliary contact if the battery is in maintenance phase. If the extended reduced floating function is activated, the contact is also activated in this phase.

8.1.1.5.20 Battery charging in reduced floating phase {1243} {1351} and

8.1.1.5.21 Battery charging in periodic absorption phase {1244} {1352}

You can activate the auxiliary contacts on the reduced floating phase and the periodic absorption phase.

8.1.1.5.22 Autonomy test in progress {1529} {1530}

This parameter allows you to activate the auxiliary relays if an autonomy test is in progress. In that case, the relays are activated on the two types of test : monthly or weekly.

8.1.1.6 Contacts activated by the battery voltage {1245} {1353}

These configurations allow activation of the auxiliary contacts if the battery voltage passes below a selected voltage during a period that is configurable as well. Three voltages linked to three durations are configurable to activate the auxiliary contact. The auxiliary contact will only be activated after the battery exceeds again a certain voltage value and also after a duration, both independently of the activation parameters.
This voltage and this duration are programmable too.

- Dynamic compensation of the thresholds {1288} {1354}
- Voltage 1 active {1246} {1355}
- Voltage 1 {1247} {1356}
- Duration 1 {1248} {1357}
- Voltage 2 active {1249} {1358}
- Voltage 2 {1250} {1359}
- Duration 2 {1251} {1360}
- Voltage 3 active {1252} {1361}
- Voltage 3 {1253} {1362}
- Duration 3 {1254} {1363}
- Voltage for deactivation of the auxiliary contact {1255} {1364}
- Duration over battery voltage for deactivation {1256} {1365}
- Deactivate if the battery is in floating mode {1516} {1517}

8.1.1.6.1 Dynamic compensation of the thresholds {1288} {1354}

If the contacts are activated according to the battery voltage, you can use the voltage dynamically compensated for each threshold.
If this function is not activated, the average battery voltage will be used.
If this function is activated, the real battery voltage is compensated according the power used.

8.1.1.6.2 Deactivate if the battery is in floating mode {1516} {1517}

If you activate one of the auxiliary contacts according to the battery voltage, you can force the deactivation if the battery is in floating mode. In this way, even if the deactivation voltage is not reached or if the duration of the voltage deactivation is not completed, the auxiliary contact will be released.

8.1.1.7 Contacts activated by inverter power or Smart-Boost {1257} {1366}

If the power output of the inverter exceeds a certain level, the contact may be activated. The excess is linked to a duration. Three power levels linked to three durations are configurable to activate the auxiliary contact.
The auxiliary contact will only be activated after the output power passes below a value and over a duration, both independently of the activation configurations.
If the Smart-Boost function is active, these configurations are also taken into account with the power of the boost.

- Power 1 active {1258} {1367}
- Power 1 {1259} {1368}
- Duration 1 {1260} {1369}
- Power 2 active {1261} {1370}
- Power 2 {1262} {1371}
- Duration 2 {1263} {1372}
- Power 3 active {1264} {1373}
- Power 3 {1265} {1374}
- Duration 3 {1266} {1375}
- Power for deactivation of the auxiliary contact {1267} {1376}
- Duration below power for deactivation {1268} {1377}

8.1.1.8 Contacts activated according to the battery temperature {1503} {1504}

You can activate an auxiliary contact according to the battery temperature. This function is available with the temperature sensor BTS-01 or with the battery monitor BSP. Two distinct thresholds allow a switch on and off of the contact at different temperatures.

- Contact active with the battery temperature {1446} {1457}
- Auxiliary contact activated below {1447} {1458}
- Auxiliary contact deactivated below {1448} {1459}

8.1.1.9 Contacts activated on battery state of charge (SOC) {1501} {1502} (function active only with a BSP)

You can activate the auxiliary contacts according to the battery state of charge. If the battery state of charge goes below a given threshold, the contact will be activated. A duration can be linked to the threshold, which means that the battery state of charge must be below this threshold within the choosen duration, before the contact is activated.
The contact is deactivated when the battery state of charge goes again below a specific threshold that can be also linked to a duration.
The contact can also be deactivated when the battery reaches the floating phase.

- Level SOC 1 active {1439} {1442}
- Level SOC 1 {1440} {1443}
- Duration 1 {1581} {1590}
- Level SOC 2 active {1582} {1591}
- Level SOC 2 {1583} {1592}
- Duration 2 {1584} {1593}
- Level SOC 3 active {1585} {1594}
- Level SOC 3 {1586} {1595}
- Duration 3 {1587} {1596}
- Level SOC to deactivate the auxiliary contact {1441} {1444}
- Duration on level for deactivation {1588} {1597}
- Deactivate if the battery is in floating phase {1589} {1598}

8.1.1.10 Security : Limit the time of activation {1512} {1513}

	Caution : If the maximum duration for the relay activation that you have selected is reached and if the activation conditions are still present (for instance a battery undervoltage), **the contact will not be reactivated as long as the conditions are present**. Therefore there is a risk that the auxiliary contact remains locked in this deactivated state and you will have to reset manually this alarm by deactivating and then activating this parameter. Use this function with care and only as a security.

8.1.1.11 Maximum duration of activation {1514} {1515}

When the conditions are met, either one or two relays are activated permanently. If you wish that the activation duration is limited in time, even if the conditions are met, you can activate this function. Once the relay is activated, a countdown runs according to the duration you have selected. Once this countdown is completed the relay is released, even if the conditions are still there. The relay can not be anymore activated as long as the activation conditions have not disap-peared.

8.1.1.12 Reset all settings {1569} {1570}

This function serves to reset all previous settings done on the corresponding auxiliary contact. Once this operation done, the auxiliary contact is not activated anymore. Caution: this function cannot be cancelled.

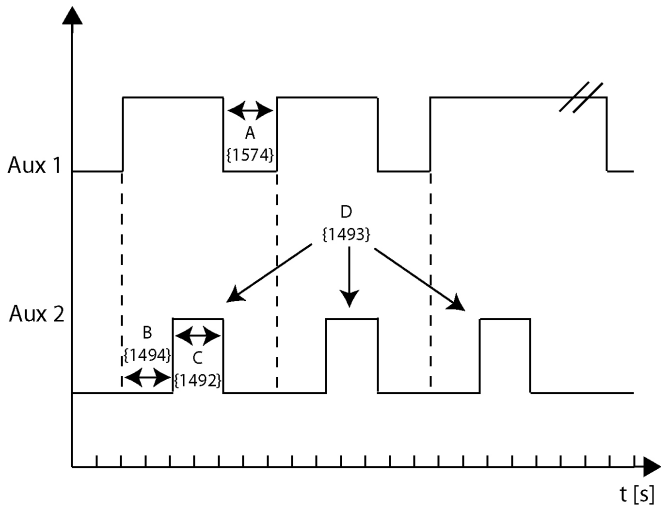
	Use this function before programming any function for an auxiliary contact. By doing this way you are sure that you begin with no unexpected setting who can activate the contact.

8.1.2 AUXILIARY CONTACTS 1 AND 2 EXTENDED FUNCT. {1489}

8.1.2.1 Generator startup

The two contacts may be combined in order to automatically start up a generator equiped with an electric starter. In this case the two contacts are dedicated to this function.
Auxiliary contact 1 serves as an operational contact and auxiliary contact 2 as a startup contact.

The startup condition of the generator must be programmed with the configurations of auxiliary contact 1. The startup is carried out by first activating the operational contact and then activating the startup contact. The latter engages several times, if necessary, to start up the motor. If a voltage appears at the terminals of AC In, the startup contact is released.



A. Main contact hold/interrupt time {1574}
B. Time before a starter pulse {1494}}
C. Starter pulse (with AUX2) {1492}
D. Number of starting attempts {1493}

8.1.2.1.1 Generator control {1491}

Activates the combination of the two auxiliary contacts for the generator start and the management of the start impulses.

8.1.2.1.2 Number of starting attempts {1493}

The start contact is activated a limited number of times in order to protect the starter if the generator has a fault. Once the maximum number of start has been reached, the operational contact is also deactivated. For a new attempt to be made the condition that generated the start must disappear and reappear.

8.1.2.1.3 Starter pulse (with AUX2) {1492}

With this configuration you can adjust the time at which the start contact is activated.

8.1.2.1.4 Time before a starter pulse {1494}

This configuration determines the duration between the start attempts. It also determines the duration between the activation of the operational contact and the first attempt at restarting.

8.1.2.1.5 Main contact hold/interrupt time {1574}

Some generators must have the main contact completely stopped between the cranking attempts (choke pulse). This parameter allows to set this duration.

9 Configuration of AC Transfer

9.1 Activate immediate detection of grid outage (UPS) {1435}

This parameter allows to starting the inverter mode as quick as possible in case of fluctuations of the AC-In grid. This function is useful when it comes to very sensitive loads that require an uninterruptible power supply (UPS). If this function is active, being connected to a fluctuating source (weak grid or unstable generator) will lead to a frequent switching between inverter and charger modes by opening and closing of the transfer relay.

9.2 Tolerance on the immediate detection of a grid loss {1510}

When the immediate detection of a grid loss is activated, this parameter allows you to increase or decrease the detection sensitivity. The higher the figure the weaker the sensitivity.

9.3 Transfer AC-In for delayed transfer opening {1199}

This configuration determines the voltage below which the transfer relay will open after a certain period of time. The UPS will then run in inverter mode.

9.4 Delay before passing to inverter {1198}

When the input voltage is below the transfer voltage to the inverter, the transfer relay does not open immediately. With this configuration, the period during which the transfer remains drawn can be specified. After this duration, the transfer relay is opened and the inverter function is activated (if the function has not been blocked or deactivated).
This delay is particularly useful on less stable grids or with generators with an output voltage that varies considerably during the activation of heavy loads.

9.5 Immediate transfer AC-In voltage {1200}

Use the adjustment of this configuration to adjust the critical voltage for the operation of equipment that must not experience interruptions. In the case of a fluctuating grid, if its voltage passes below the value of the configuration this immediately activates the inverter function, thereby ensuring supply to the consumers.

9.6 Frequency delta accepted above End {1505}

This setting allows you to determine the upper limit of the accepted frequency. This value is added to parameter {1112}, the output frequency of the inverter. If the frequency of the source exceeds this value, the transfer relay is opened after the duration determined by the setting {1507}.

9.7 Frequency delta accepted below End {1506}

This setting allows you to determine the lower limit of the accepted frequency. This value is subtracted from parameter {1112}, the output frequency of the inverter. If the frequency of the source is lower than this value, the transfer relay is opened after the duration determined by this setting {1507}.

9.8 Duration of erroneous frequency before disconnecting the transfer relay {1507}

If the input frequency is not included among the values determined by the settings above, the transfer relay is deactivated after the duration determined by this setting.

9.9 AC-In current active filtering {1575}

When this parameter is activated, the current taken on AC-Input is a sinusoid in phase with voltage. This means only active power is taken from the generator. The inverter compensates harmonics and reactive current from the source.
This function also avoids fast speed change on the generator due to loads jumps.

	For the filtering to work, it is also necessary to activate the Smart-Boost function {1126} and to authorize the charger {1125}

	This function is not possible with Xtender in parallel. Single units, dual or three phase with only one Xtender per phase are allowed and functional.

10 Intended Purpose Usage

Important	**Before setting the units to work, read the technical documentation carefully.**

Important	**The latest version of the technical documentation or the corresponding technical supplements is valid in each case.**

The iUPS101 is built using modern components and is extremely reliable in operation; however it must only be used for its intended purpose. Please note that the intended purpose also includes compliance with the instructions issued by the manufacturer for installation, setting up and service.
Any other use is regarded as conflicting with the intended purpose. The manufacturer is not liable for any subsequent damage resulting from such inadmissible use. The user bears the sole risk in such cases.

10.1 Transportation and Storage

All iUPS101 devices must be so transported and stored that they are not subjected to any excessive mechanical stresses.

IMPORTANT!	**For systems with periods of inactivity, such as a long shutdown or moving/storing a mobile system where the UPS is not in use and there is no AC mains supply. Users should remove the incoming AC and DC supplies to the system when not in use.**

10.2 Authorized Persons

Only persons trained for the purpose are authorized to handle the iUPS101; they must be familiar with the unit and must be aware of the regulation and provisions required for explosion protection as well as the relevant accident prevention regulations.

10.3 Cleaning and Maintenance

WARNING!	**The iUPS101 has two different supplies. Both the AC mains input and DC battery input must be isolated before accessing the enclosure**

If the iUPS101 Ex ‘d’ box is scheduled for maintenance / inspection, then all work on the iUPS101 must be carried out by personnel who are qualified for such activities. Fasteners for the lid of the Ex ‘d’ enclosure must be grade A2-70 or better, and the maximum permitted gap between flanged joint of lid and enclosure base is 0.04mm

10.4 Safety Precautions

Important	**For the installation, maintenance and cleaning of the units, it is absolutely necessary to observe the applicable regulations and provisions concerned with explosion protection (EN 60079-14:2008) as well as the Accident Prevention Regulations.**

10.5 Cleaning and Maintenance Intervals

The cleaning intervals depend on the environment where the system is installed.

10.6 Aggressive substances and environments

The iUPS101 is not designed to come into contact with aggressive substances or environments, please be aware that additional protection may be required.

10.7 Exposure to external stresses

The iUPS101 is not designed to be subjected to excessive stresses e.g. vibration, heat, impact. Additional protection is required to protect against these external stresses.

The iUPS101 will require additional protection if it is installed in a location where it may be subjected to damage.

INSTALLATION AND MAINTENANCE INSTRUCTION FOR ATEX CERTIFIED iSTB ENCLOSURE ASSEMBLIES

These enclosures are designed for use in hazardous locations and are manufactured in accordance with the following standards:
EN 60079-0:2009
EN 60079-7:2007
EN 60079-31:2009
The installation instructions listed below have been based on the following documents;

- Ex e Component Certificates for enclosures and terminals.
- Ex e, Ex ia & Ex e ia Certificates of Conformity for assemblies. Only those components listed on the relevant certificate may be used
- EN 60079 - 14 – Code of Practice for selection, installation & maintenance of electrical apparatus for use in potentially explosive atmospheres.
- Established installation / engineering practice.

General:

- The enclosure assembly shall not be permitted to operate beyond a maximum AMBIENT temperature range defined on drawings IEL00013 issue 2 and IEL00014 issue 2.
- Alterations or modifications to the enclosure or its contents may invalidate the certification.
- Observe information marked on the external certification label, e.g. Type/s of Protection, Gas Group and Temperature Class. The maximum surface temperature the enclosure may be permitted to reach is 135ºC (T4)
- Precautions must be taken to ensure that the thickness of dust layer on the terminal box will not exceed 5mm.
- Ensure that all lid and gland plate screws are fully tightened after installation. Torque Values are as follows:
  Lid Screws – 2Nm, Gland Plate Screws – 4Nm. Earthstud (M6) – 5Nm.

Mounting:

- The enclosure must be mounted on an even surface with each fastening point resting evenly.
- Appropriate fixings for the installation must be used in each point provided (recommend minimum 8mm diameter bolts or screws).

Glanding:

- Cable glands and stopping plugs must be suitable for the application and must maintain a minimum degree of protection of IP54 for use in gas / vapour atmospheres (Ex e), and IP6X for use in dust atmospheres. The enclosure assembly shall not be permitted to operate beyond a maximum AMBIENT temperature range defined on drawings IEL00013 issue 2 and IEL00014 issue 2
- The installer is permitted to drill entries in areas specified on the certified drawings.
- Where a gland plate is provided with an auxiliary earthstud, it shall be connected to the main enclosure earthstud with an appropriately sized conductor.
- External identification labels may be fitted by the installer but must maintain a minimum degree of protection of IP54 for use in gas / vapour atmospheres (Ex e), and IP6X for use in dust atmospheres.

Terminals and Wiring:

- Conditions or limitations listed on the relevant terminal component certificates must be observed.
- The conductor insulation shall have a temperature rating appropriate to the T-class of the apparatus.
- Wiring within the enclosure must not be grouped or bunched to prevent “hot spots” forming.
- Only one conductor per terminal clamp is permitted.
- All terminal screws, used and unused shall be fully tightened.
- Any cross-connected terminal shall be mounted and used subject to limitations given in the certification documents for that terminal.
- Conductors connected to terminals shall be insulated for the appropriate voltage and the insulation shall extend to within 1mm of the terminal block clamp or cable lug.
- All strands of the conductor must enter the terminal clamp.
- Minimum creepage and clearance distances specified in the appropriate standard, e.g. EN 60079-7 (Ex e) or EN 60079-11 (Ex i) must be maintained.
- Observe minimum wiring distance specified on the certified drawings.
- Terminals for the connection of intrinsically safe and non-intrinsically safe terminals housed in the same enclosure shall be separated by at least 50mm. This may be achieved by physical spacing or fitting the correct partition between the different terminal groups.
- Marking for Ex e and Ex ia certification is as shown:

Special conditions for safe use:

- The user/installer shall install this terminal box taking into account any restrictions or special conditions for safe use that are applicable to the previously certified devices that are fitted in the terminal box
- To maintain the ingress protection of IP66, any cable entry device shall be certified Ex e and shall be suitably rated IP66 and suitable for the environment it is to be used in
- When the terminal box is installed in a dust explosive environment the user shall ensure that an accumulation of excessive dust layers on the enclosure is prevented

Maintenance

- A visual inspection of the apparatus shall be carried out appropriate to the installation environment; although an annual inspection is the recommended minimum.
- Inspection should include verification that all certification details are clearly legible, lid & gland plate (where fitted) screws are secured to the correct torque. Checks should also include that there is no ingress (dust or liquid) inside the enclosure and that all cable glands and main earth connections are in good order.
- After opening an enclosure, a visual inspection of the lid gasket to ensure no foreign objects may interfere with the enclosure sealing function.
- In the unlikely event that any gasket is found to be damaged it must be replaced. Index Enclosures Limited will provide instructions and materials for this activity.
- During each inspection, the enclosure should be cleaned with a damp cloth.

indEx ENCLOSURES LTD, MONTPELIER BUSINESS PARK, ASHFORD, KENT, UNITED KINGDOM, TN23 4FG
Issue 2 Aug 2012

11 Technical Data

11.1 Specification

Input Mains Power Supply	230V iUPS101: 180-265VAC (45-65Hz) 120V iUPS101: 90-150VAC (55-75Hz)
Output Power Supply	230VAC or 120VAC +/- 2%, 50/60 Hz
Maximum Power Output	3KVA - See de-rating table
Backup Time	For full load, approx 39 minutes @ 20°C or 87 minutes with additional battery enclosure. See system run time table for further details. Based on iBATT100 enclosure
Input Battery Voltage	24V / 48V
Alarm Output	2 x Programmable volt free alarm contacts, energised on a general alarm condition AC rating: 230V/12A DC rating: 24V/4A, max 50V/3A
Ingress Protection	Ex'd' Enclosure - IP66 Ex'e' Close Coupled Enclosure - IP66 Ex'e' Battery Enclosure - IP45 (Non Ex rating) / IP23 (Ex rating)
Weight	Ex'd' Enclosure + Ex'e' Close Coupled Enclosure - 90Kg Ex'e' Battery Enclosure - 122Kg
Environmental	Operating temperature: –20°C to 55°C @500VA See ambient de-rating table for further details Relative humidity; 0 to 95%, non condensing
ATEX Certification	ATEX II 2 G Ex d[e] e IIB T5 Gb
EMC	EN61000-6-4:2007, EN61000-6-2:2005
Mean Time Between Failure (MTBF)	340 000 hrs/failure

Table 7.0

11.2 Product De-rating

Table 7.1 shows the maximum permissible load for a specified Ambient operating environment. These maximum ratings should never be exceeded, as the safety of the system will be compromised.

Max Power (VA)	Max External Ambient						
	20ºC	30ºC	35ºC	40ºC	45ºC	50ºC	55ºC
500							
1000							
1500							
2000							
2500							
3000							

Table 7.1

*After running for approximately 20mins at full load above 20ºC, the max output power available can reduce by up to 15%

The reason this happens is to stop the inverter overheating when running at full load in high ambient. The output power is reduced slightly to allow the UPS to continue running and backing up loads. Continued operation at full load may cause the system to shut down to prevent damage, therefore losing all power to the connected equipment.

Important!	**Users must ensure they do not exceed the ratings shown in Table 7.0. If the system is operated outside these values, but within those shown on the rating plate / ATEX certificate, then it is possible the UPS may limit the amount of power available at the Output to protect against thermal overheating, or blow a fuse within the Ex 'd' enclosure.**

Important!	**Although the iUPS101 rating label states T6, the complete assembly is only rated at T5 due to the certification of the terminal box**

11.3 Replacement Parts

Extronics hold a range of replacement components available for same / next day dispatch. Should you require any replacement parts, or technical help please contact Extronics.

The iUPS101 is supplied with spare protection fuses which the user can replace in the event of a system overload. Please see chapter 3.4 of this manual.

For continuous operation of critical high availability systems, users are advised to implement a 'redundant' iUPS101 - this will ensure vital equipment is permanently operational in the unlikely event of a failure.

Fitted internally to the Ex 'd' enclosure is a coin cell replacement PCB + Coin cell for the purpose of electronic memory retention (Extronics Drawing / Part No. 331072). Should this need replacing, please contact Extronics for further information.

11.4 System Run Times

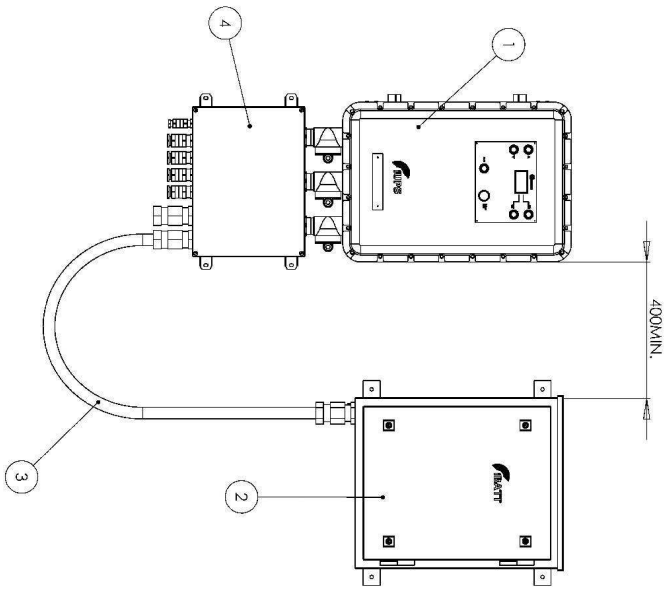
The table below shows system run times with various loads for a 24V system (using 1x iBATT100 Enclosure) and a 48V system (using 2x iBATT100 Enclosures). System run times are when using new batteries and are based on battery manufacturer's data at 20ºC discharging to 1.7Vpc

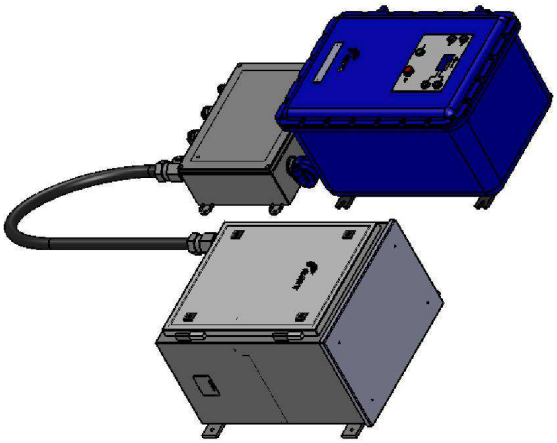
Load (VA)	Total run time 24V System (mins)	Total run time 48V System (mins)
3000	39	87
2500	50	108
2000	70	146
1500	90	205
1000	154	336
500	336	857

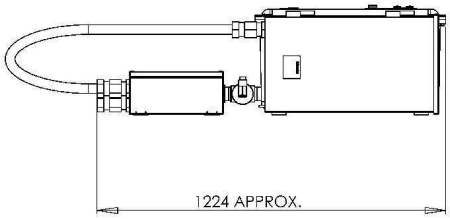
Important! **Whilst accurate to the best of our knowledge, Extronics cannot be held responsible for any discrepancies. System wiring, battery ageing, and temperature all have an influence on run times. Above 20ºC system run times will marginally improve, and below this temperature they will decrease.**

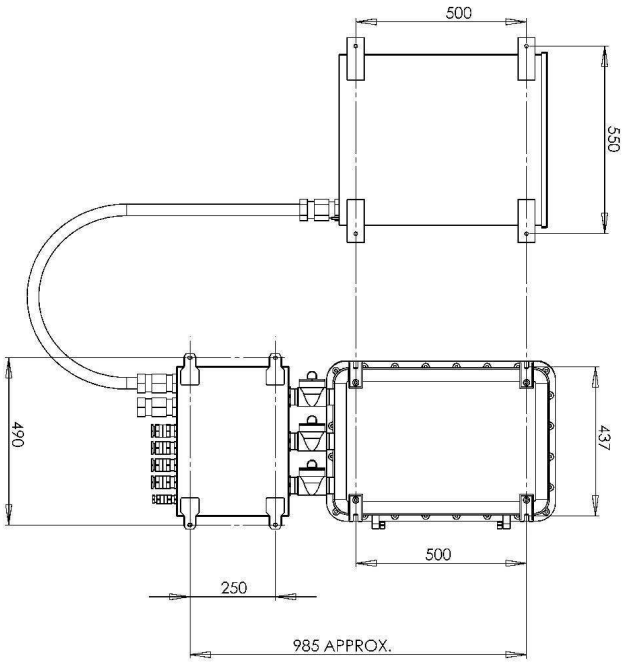
11.5 System Assembly Details

ITEM NO.	DESCRIPTION	QTY.
1	iUPS 101 Ex 'd' ENCLOSURE	1
2	iBATT 100 Ex 'e' ENCLOSURE	1
3	BATTERY CABLE	1
4	EX'e' TERMINAL BOX	1









SYSTEM DETAILS

EX'd' ENCLOSURE: MARINE GRADE ALUMINIUM CAST ALLOY,
SIZE: 670mm x 470mm x 360mm
WEIGHT: 80Kg APPROX.

EX'e' ENCLOSURE: 316L STAINLESS STEEL, BRUSHED
SIZE: 440mm x 330mm x 148mm
WEIGHT: 8Kg APPROX.

EX'e' BATTERY ENCLOSURE: 316L STAINLESS STEEL, BRUSHED
SIZE: 612mm x 515mm x 371mm
WEIGHT: 120Kg APPROX. (INCLUDING BATTERIES).

NOTES

THE EX'e' BATTERY ENCLOSURE CAN ONLY BE WALL MOUNTED IN THE VERTICAL ORIENTATION AS SHOWN

THE EX'e' TERMINAL ENCLOSURE MUST BE FIXED SECURELY BY ITS MOUNTING FEET AND NOT RELY ON THE BUSHING CONNECTIONS BETWEEN THE EX'd' AND EX'e' ENCLOSURES FOR SUPPORT. FAILURE TO THIS INVALIDATES THE ATEX CERTIFICATION.

12 Warranty Information

The Customer shall carry out a thorough inspection of the delivered project or equipment with 21 days of delivery and shall give immediate written notification to the Company of any omissions, defects or faults.

The Company warrants that the project or equipment delivered shall accord with the Quotation or Pricing Schedule and related Company specifications, but it does not warrant its fitness for any other purpose.

Extronics will make good, by repair or at Extronics option by the supply of a replacement, defects which, under proper use in accordance with specifications and manufacturer's instructions, appear in the goods within a period of twelve calendar months after the goods have been delivered and arise solely from faulty design, materials or workmanship, provided always that defective parts have been returned to Extronics if Extronics shall have so required.

The warranty of any goods is based upon a return to Extronics factory (Return to Base Warranty) which will be at the Customers cost. The repaired or new parts will be delivered by Extronics carriage paid. If you allege that goods are totally unfit for their purpose they must be returned within 7 days of receipt. Site Warranty is expressly excluded from these terms and conditions unless agreement is made in writing between the parties it.

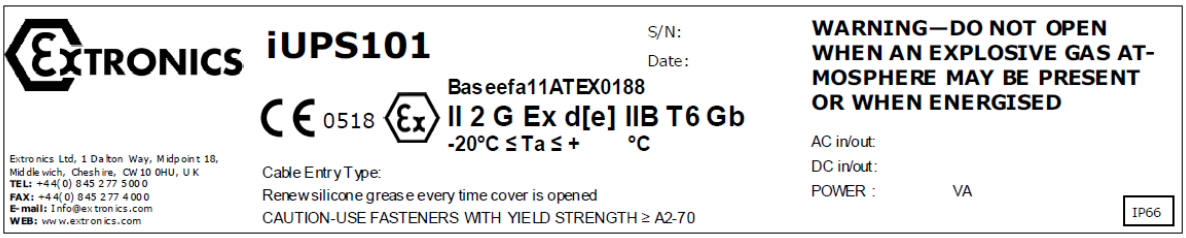
Extronics liability under this clause shall be in lieu of any warranty or condition implied by law as to the quality or fitness for any particular purpose of the goods, and save as provided in this clause Extronics shall not be under any liability, whether in contract, or otherwise, in respect of defects in goods delivered or for any injury other (than personal injury caused by Extronics negligence as defined in Section 1 of the Unfair Contract Terms Act, 1977), damage or loss resulting from such defects or from any work done in connection therewith, provided however that nothing in this clause shall operate to exclude any warranty or condition implied by law as to the quality of the goods in the event that the goods when sold by you or when sold by any person or persons to whom you may sell the goods shall become the subject of a consumer sale as defined in the Supply of Goods (Implied Terms) Act, 1973 except that any claim under such warranty or condition shall have arisen from any act or omission by you or by any person or persons selling the goods by way of a consumer sale.

13 Type Codes

iUPS101 Zone 1 UPS Enclosure	**iUPS101-[#1]-[#2]-[#3]-[#4]**
Specify option [#1] - Battery Voltage	
24V DC	24
48V DC	48
Specify option [#2] – Rated Output Power	
500VA	05
1kVA	10
1.5kVA	15
2kVA	20
2.5kVA	25
3kVA	30
Specify option [#3] – AC Voltage	
230VAC	23
120VAC	12
Specify option [#4] – AC Frequency	
50Hz	50
60HZ	60

14 Certification

14.1 Atex Label


EXTRONICS
iUPS101
S/N:
Date:
Baseefa11ATEX0188
CE 0518
II 2 G Ex d[e] IIB T6 Gb
-20°C ≤ Ta ≤ + °C
Extronics Ltd, 1 Dalton Way, Midpoint 18,
Middlewich, Cheshire, CW10 0HU, UK
TEL: +44(0) 845 277 5000
FAX: +44(0) 845 277 4000
E-mail: Info@extronics.com
WEB: www.extronics.com
Cable Entry Type:
Renew silicone grease every time cover is opened
CAUTION-USE FASTENERS WITH YIELD STRENGTH ≥ A2-70
WARNING—DO NOT OPEN WHEN AN EXPLOSIVE GAS ATMOSPHERE MAY BE PRESENT OR WHEN ENERGISED
AC in/out:
DC in/out:
POWER : VA
IP66

14.2 Atex Certificate

Certificate Number
Baseefa11ATEX0188

Issued 22 August 2011
Page 1 of 3

1 **EC - TYPE EXAMINATION CERTIFICATE**

2 **Equipment or Protective System Intended for use in Potentially Explosive Atmospheres Directive 94/9/EC**

3 EC - Type Examination Certificate Number: **Baseefa11ATEX0188**

4 Equipment or Protective System: **iUPS101 Control Unit**

5 Manufacturer: **Extronics Limited**

6 Address: **1 Dalton Way, Midpoint 18, Middlewich, Cheshire, CW10 0HU**

7 This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 Baseefa, Notified Body number 1180, in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential Report No. **11(C)0185**

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0: 2009
EN 60079-1: 2007
EN 60079-7: 2007

except in respect of those requirements listed at item 18 of the Schedule.

10 If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC - TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified equipment or protective system. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

12 The marking of the equipment or protective system shall include the following :

Ⓔx II 2G Ex d[e] IIB T6 Gb (-20°C ≤ Ta ≤ +40/55°C*) *see schedule

This certificate may only be reproduced in its entirety, without any change, schedule included.

Baseefa Customer Reference No. **3700**

Project File No. **11/0185**

This certificate is granted subject to the general terms and conditions of Baseefa. It does not necessarily indicate that the equipment may be used in particular industries or circumstances.

R S SINCLAIR
DIRECTOR
On behalf of
Baseefa

Baseefa
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Buxton, Derbyshire SK17 9RZ
Telephone +44 (0) 1298 766600 Fax +44 (0) 1298 766601
e-mail info@baseefa.com web site www.baseefa.com
Baseefa is a trading name of Baseefa Ltd
Registered in England No. 4305578. Registered address as above.

13 **Schedule**

14 **Certificate Number Baseefa11ATEX0188**

15 **Description of Equipment or Protective System**

The **iUPS101 Control Unit** comprises a Type EJB-61 Enclosure with a rectangular window in the cover as manufactured by F.E.A.M. S.r.I to BKI10ATEX0007U, coded Ex d IIB Ex tD A21 IP66 (Ta -20°C to +60°C).

The cover is secured to the enclosure base by 24 off stainless steel socket head cap screws of grade A2-70.

In addition to the rectangular viewing window, the cover may be fitted with up to six push-button actuators and two indicator lamps all as detailed by BKI11ATEX0010U. The underside of the cover is fitted with a control/display module aligned with the actuators and window.

The interior of the enclosure comprises an assembly of up to the following component parts/modules, all mounted either from the steel baseplate or on the steel UPS framework:-

a. An Uninterrupted Power Supply (UPS) assembly incorporating:-

   i. A UPS Printed Circuit Board.
   ii. Three 24V cooling fans.
   iii. A large toroidal transformer.
   iv. A series of smaller toroidal and current transformers.
   v. A coin cell replacement PCB.

b. A battery protection module PCB.
c. Two contactors.
d. Two current sense PCBs.
e. Three input/output circuit protection fuses.
f. Three copper busbars.

The unit is designed to operate from both a 230V a.c. mains input and a 24V d.c. or 48V d.c. external battery pack, to give an uninterrupted output of 230V a.c. at up to 3kVA (together with top-up battery charging).

In addition the unit output may be de-rated for use at different maximum ambient temperatures as follows:-

Maximum Output Rating	Maximum Ambient
Up to 3kVA	40°C
Up to 2.5kVA	45°C
Up to 2kVA	50°C
Up to 1kVA	55°C

The enclosure base includes up to six cable entries of sizes up to 1½" NPT or M40 for the accommodation of flameproof cable entry devices, with or without the interposition of a flameproof thread adapter. Unused entries are to be fitted with suitable certified flameproof stopping plugs.

The cable entry devices, thread adapters and stopping plugs shall be suitable for the equipment, the cable and the conditions of use and shall be certified as Equipment (not a Component) under an EC-Type Examination Certificate to Directive 94/9/EC.

16 Report Number

Baseefa Certification Report No. 11(C)0185

17 Specific Conditions of Use

None

18 Essential Health and Safety Requirements

All relevant Essential Health and Safety Requirements are covered by the standards listed at item 9.

19 Drawings and Documents

Number	Issue	Date	Description
330478 Sheets 1 & 2	PRE07	24/03/2011	General Arrangement, iUPS101 Control Unit
331072	2	13/06/2011	iUPS101 Coin Cell
331106	02	20/06/11	Battery Protection Module, Increased Safety (Ex e)
331379	03	04/08/11	Certification and Rating Nameplate

Certificate Number
Baseefa11ATEX0188/1

Issued 28 May 2012
Page 1 of 2

1 **SUPPLEMENTARY EC - TYPE EXAMINATION CERTIFICATE**

2 **Equipment or Protective System Intended for use in Potentially Explosive Atmospheres Directive 94/9/EC**

3	Supplementary EC - Type Examination Certificate Number:	**Baseefa11ATEX0188/1**
4	Equipment or Protective System:	**iUPS101 Control Unit**
5	Manufacturer:	**Extronics Limited**
6	Address:	**1 Dalton Way, Midpoint 18, Middlewich, Cheshire, CW10 0HU**

7 This supplementary certificate extends EC – Type Examination Certificate No. **Baseefa11ATEX0188** to apply to equipment or protective systems designed and constructed in accordance with the specification set out in the Schedule of the said certificate but having any variations specified in the Schedule attached to this certificate and the documents therein referred to.

This supplementary certificate shall be held with the original certificate.

This certificate may only be reproduced in its entirety, without any change, schedule included.

Baseefa Customer Reference No. **3700**

Project File No. **12/0267**

This certificate is granted subject to the general terms and conditions of Baseefa. It does not necessarily indicate that the equipment may be used in particular industries or circumstances.

pp R S SINCLAIR
DIRECTOR
On behalf of
Baseefa

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e-mail info@baseefa.com web site www.baseefa.com
Baseefa is a trading name of Baseefa Ltd
Registered in England No. 4305578. Registered address as above.

13 **Schedule**

14 **Certificate Number Baseefa11ATEX0188/1**

15 Description of the variation to the Equipment or Protective System

Variation 1.1

Introduction of a 120V a.c. input/output rating option.

Variation 1.2

Introduction of a further two optional cover mounted push-buttons or indicator lamps, together with an increase in the maximum permitted cable entry sizes to M63 or 2" NPT.

Variation 1.3

Miscellaneous minor construction changes to aid production.

16 Report Number

None

17 Specific Conditions of Use

None

18 Essential Health and Safety Requirements

Compliance with the Essential Health and Safety Requirements is not affected by this variation.

19 Drawings and Documents

Number	Sheet	Issue	Date	Description
330478	1	08	15/05/12	General Arrangement & Notes, iUPS101 Control unit
330478	2	08	08/05/12	Internal Arrangement, iUPS101 Control Unit
331379	-	04	30/04/12	Certification Label

14.3 iUPS101 EC Declaration of Conformity

Hazardous Area Specialists

EC Declaration of Conformity

Extronics Ltd, 1 Dalton Way, Midpoint 18, Middlewich, Cheshire, CW10 0HU, UK

Declare under sole responsibility that the product,

iUPS101

To which this declaration relates is in accordance with the provision of the following directives

94/9/EC Equipment and protective systems intended for use in potentially explosive atmospheres.

04/108/EC CE Marking for Electromagnetic Compatibility Directive

EC type Examination Certificate
Baseefa11ATEX0188, latest supplement Baseefa11ATEX0188V1 dated 28/05/2012

Provisions of Directive fulfilled by the equipment
Ex II 2 G Ex d[e] IIB T6 Gb (-20°C ≤ Ta ≤ +40°C/55°C)

Notified Body for EC Type Examination
Baseefa, Rockhead Bus. Park, SK17 9RZ

Notified Body for production
SIRA, 0518, Sira Chester UK

And is in conformity with the following standards or other nominative documents

EN60079-0:2009	Electrical apparatus for potentially explosive atmospheres. General requirements
EN60079-1:2007	Electrical apparatus for potentially explosive gas atmospheres – Flameproof enclosures 'd'
EN60079-7:2007	Explosive atmospheres - Part 7: Equipment protection by increased safety 'e'
EN61000-6-2:2005	Electromagnetic compatibility (EMC). Generic standards. Immunity for industrial environments
EN61000-6-4:2007	Electromagnetic compatibility (EMC). Generic standards. Emission standard for industrial environments

Note: The iUPS101 satisfies points 1. And 2. Of Schedule 17 (Special Conditions for Safe Use) for iBATT100 product certificate number BaseefaATEX0191X. The iUPS101 contains 160A protection fuse in battery supply line, and a certified charging circuit that meets the requirements of EN60079-7 with a maximum charge current limited to 40A.
Signed

D.J.C

David Crump
Engineering Manager

Date: 01/11/13

332011 Rev 03

Extronics Ltd · 1 Dalton Way · Midpoint 18 · Middlewich · CW10 0HU Tel +44 (0)845 277 5000 Fax +44 (0)845 277 4000 E-mail info@extronics.com Web www.extronics.com
Incorporated in England and Wales. Registration No. 3076287

14.4 UPS System EC Declaration of Conformity

EXTRONICS Hazardous Area Specialists

System EC Declaration of Conformity

Extronics Ltd, 1 Dalton Way, Midpoint 18, Middlewich, Cheshire, CW10 0HU, UK

Declare under sole responsibility that the product,

Zone 1 UPS System: Ex II 2 G Ex d[e] IIB T5 Gb (-20°C to +40/55°C)

Country of Manufacture: United Kingdom

Consisting of the following certified items:

iUPS101	**Ex II 2 G Ex d[e] IIB T6 Gb**	(Baseefa11ATEX0188)
iBATT100	**Ex II 2 G Ex e IIC T6 Gb**	(Baseefa11ATEX0191X)
iSTB Junction Box	**Ex II 2 G Ex e IIC T5 Gb**	(SIRA11ATEX3241X)
EZS Sealing Fittings	**Ex II 2 G Ex d IIC**	(ICEPI 11 ATEX 03C002)
NP Conduit Fittings	**Ex II 2 G Ex d IIB/IIC Ex e II**	(LOM 06 ATEX 3079U)
CR Cable Glands	**Ex II 2 G Ex d IIC Gb Ex e IIC Gb**	(BAS01ATEX2271X)
Stopping Plugs	**Ex II 2 G Ex d IIC Gb Ex e IIC Gb**	(Sira 00ATEX1094X)

To which this declaration relates, is in accordance with the provision of the following directives

94/9/EC Equipment and protective systems intended for use in potentially explosive atmospheres.

04/108/EC CE Marking for Electromagnetic Compatibility Directive

And is in conformity with the following standards or other nominative documents

EN60079-0:2004	Electrical apparatus for potentially explosive atmospheres. General requirements (A review against EN60079-0:2012, which is harmonized, shows no significant changes relevant to this equipment, so EN60079-0:2004 continues to represent 'state of the art')
EN60079-0:2006	Electrical apparatus for potentially explosive atmospheres. General requirements (A review against EN60079-0:2012, which is harmonized, shows no significant changes relevant to this equipment, so EN60079-0:2006 continues to represent 'state of the art')
EN60079-0:2009	Electrical apparatus for potentially explosive atmospheres. General requirements (A review against EN60079-0:2012, which is harmonized, shows no significant changes relevant to this equipment, so EN60079-0:2009 continues to represent 'state of the art')
EN60079-0:2012	Explosive atmospheres - Part 0: Equipment - General Requirements
EN60079-1:2004	Electrical apparatus for potentially explosive atmospheres. Flameproof enclosures 'd' (A review against EN60079-1:2007, which is harmonized, shows no significant changes relevant to this equipment, so EN60079-1:2004 continues to represent 'state of the art')
EN60079-1:2007	Electrical apparatus for potentially explosive gas atmospheres – Flameproof enclosures 'd'
EN60079-7:2003	Electrical apparatus for potentially explosive atmospheres. Increased safety 'e' (A review against EN60079-7:2007, which is harmonized, shows no significant changes relevant to this equipment, so EN60079-7:2003 continues to represent 'state of the art')
EN60079-7:2007	Explosive atmospheres - Part 7: Equipment protection by increased safety 'e'
EN60079-14:2008	Explosive atmospheres - Part 14: Electrical installations design, selection and erection
EN61000-3-2:2005	Electromagnetic compatibility (EMC) - Part 3-2 - Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase). *This is certified by the manufacturer of the internal UPS hardware contained within the iUPS101 system.
EN61000-6-2:2005	Electromagnetic compatibility (EMC). Generic standards. Immunity for industrial environments
EN61000-6-4:2007	Electromagnetic compatibility (EMC). Generic standards. Emission standard for industrial environments
EN62040-1:2008	Uninterruptable power systems (UPS) – Part 1: General and Safety requirements for UPS

Signed

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15 Manual Revision

Revision	Description	Date	Approved By
PRE-01	First release	10/08/2011	A. Peek
01	Approved Document	18/10/2011	B. Seaby
02	120V added, Aux programming details, Run times added, new Aux terminal layout	06/06/2012	A. Peek
03	Added battery disconnection warning.	23/07/2012	A.Peek
04	Changed lamp logic	17/08/2012	A.Peek
05	Added AC changeover programming, Updated D of C, Added spares & iSTB info	20/09/2012	A.Peek
06	Updated information on battery disconnection	08/11/2012	A.Peek
07	Updated run times in spec table	12/03/2013	A.Peek
08	Added DD module & R-Estop info	16/05/2013	A.Peek
09	Updated iUPS101 & system D of C added	12/11/2013	N. Eardley